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Government Plans for the Railways

THAT further delay must occur before the Government publishes its proposals for the reorganisation of the railways was implied last Monday by Mr. Alan Lennox-Boyd, Minister of Transport. Answering a question in the Commons as to the date of publication of the forthcoming White Paper on railway reorganisation he said that no scheme under the recent Transport Act for this purpose had been submitted to him by the British Transport Commission. For many weeks before the Act received the Royal Assent the future of the railways had been discussed between the Minister and his advisers and the Commission. Apart from enjoining abolition of the Railway Executive and decentralisation of the railways, with Scotland expressly mentioned as an area in which a measure of railway autonomy is to be granted, the Act allows wide scope in any proposals. This complicates the task of the Commission which with its large measure of responsibility for shaping the existing organisation of British Railways, could hardly be expected to favour the form of decentralisation which the Government seems to have in mind. The Act provides that the Commission shall

submit its proposals in the form of a scheme to the Minister within twelve months from its passage, on May 6. The scheme, as approved by the Minister, must be laid before Parliament, so that some time must elapse before the new organisation comes into being. Moreover changes will have taken place later this summer in the personnel of the Commission as contracts expire, and it is hard to see how such changes can fail to influence the attitude of the Commission to the new order. Meanwhile the delay in publishing the White Paper is having deplorable effects on the morale of those railwaymen whose future may be affected. The defects of the present functional organisation are enough to harass those responsible for its execution without the complication of uncertainty as to their future. For that reason alone it is to be hoped that the White Paper will be published with the minimum delay. What shape the scheme will take can only be conjectured. There is hope that it will take the form of railway organisation such as we have already proposed: but at least the future organisation should be preferable to the present one.

Smoothing the Way to Decentralisation

A REPORT on "Management under Nationalisation," published by the Acton Society Trust, sees the advocacy of decentralisation in nationalised industry as an assertion of the importance of the operational manager. The report, noticed in our Publications Received columns this week, presents a series of studies of managers in the coal, electricity generation, road transport, and gas industries, and compares their present status and circumstances with those they knew before. It is concluded that a decentralisation policy in a nationalised industry may bring a genuine conflict between the demands of Parliamentary accountability and public control on the one hand, and the traditional conception of managerial initiative on the other. Reconciling this problem is held to be an essential preliminary to successful decentralisation. It calls for confidence between different levels of an organisation, and confidence of a type that hitherto in large undertakings has grown up over a period of time. Emphasis is laid therefore on the necessity of developing new techniques for the training and development of managers of the required quality for all levels of the organisation. The ease with which decentralisation is achieved will also depend to a great degree on how well the old traditions, when it worked satisfactorily, have been kept alive.

New Works on the Gold Coast

THE main line between Takoradi, the chief port of the Gold Coast, and Accra, the capital, also on the coast, is in the shape of an inverted V, with its apex at Kumasi, the chief town of Ashanti territory. The railway route is 361 miles long, although the termini are only 120 miles apart in a direct line. Part of the intervening country is tapped by the Central Provinces line which leaves the Takoradi-Kumasi line at Huni Valley and strikes eastwards for 98 miles to Kade. Work is now to begin on a 51-mile line linking Achiasi on this branch with Kotoku on the Kumasi-Accra line, which will shorten the overall distance to 143½ miles, and a £2,000,000 contract for the construction has been awarded, as recorded elsewhere in this issue, to Taylor Woodrow (West Africa) Limited. Some 1,500,000 cu. yd. of excavation will be necessary, and seven stations and a number of bridges and culverts will be built. Taylor-Woodrow completed earlier this year a £3,500,000 extension at Takoradi harbour, where it is carrying out further work. It is also building a branch line from Achimota, north of Accra, to Tema, some 20 miles to the east of Accra, where a second deep-water port to serve the colony is being laid out.

Progress in Permanent Way Rehabilitation

SEVEN years of unremitting labour have now restored main line tracks of this country to their former standard and once again speeds up to 90 m.p.h. are permitted in some cases. Although during the war there was no ques-

tion of relaxing the standard of safety, the reduced labour force which could be deployed and the need to concentrate on the repair of war-damaged sections meant that only essential permanent way work could be carried out. When after the war the task of making up the leeway began, men and materials were still scarce. To offset the shortage and speed up the work, intensive staff training schemes were instituted and greater mechanisation was resorted to. Cleaning and tamping ballast by machine, and laying pre-assembled track lengths by crane are among mechanical aids now widely used. Revised standards for cant and alignment have been adopted and applied. A notable advance has been in the highly-specialised study of soil mechanics, with beneficial results in blanketing and restoring the formation after slips. As pointed out elsewhere in this issue in a summary of progress made in bringing back the permanent way to its prewar excellence, the unification of the railways has enabled ideas and resources to be pooled with advantage to the progress of the work.

Passenger Developments in Spain

THE necessity for speed, partly to satisfy a growing public demand and partly to compete with the aeroplane and the private motorcar, has led the Spanish National Railways to extensive diesel haulage for long-distance day expresses. Apart from the electrified sections, where the main reason for electrification usually is quicker movement of freight over steeply graded lines, steam seems likely to remain for some time the motive power for the heavily loaded long-distance night trains. The best known diesel development is the lightweight Talgo train between Madrid and the French frontier at Irun/Hendaye; this has been so successful that, as recorded in our July 3 issue, fifteen more Talgo-type trains are included in equipment schedules for purchase. It has, incidentally, proved economic to work this train with a diesel locomotive throughout, including the electrified sections of the former Norte main line, rather than adapt the ends of electric locomotives to couple up with Talgo stock. The Fiat three-car diesel ("T.A.F.") sets now are running not only on the Norte but also over former M.Z.A. main lines, between Madrid and Barcelona, Seville, Valencia, and elsewhere. An example of the service is the T.A.F. timing of 10 hr. 20 min. between Madrid and Barcelona, 420 miles, compared with over 14½ hr. by the fastest night express. All main-line trains in Spain tend to be crowded, especially the high-speed services.

Popularity of High-Speed Day Trains

DESPITE the preponderance of single line, the punctuality of both ordinary expresses and high-speed trains in Spain is good, except at peak traffic periods. If the fast diesel-hauled day train is creating traffic and is popular with the travelling public, it seems also to have drawn upper class traffic away from the night expresses, most of which include sleeping cars of the Compagnie Internationale des Wagons-Lits. Given the extreme climate in which most long journeys are made, the popularity of day travel, long even by high-speed train, and with meals served to passengers in their seats, is remarkable. Against this, only a second class ticket, with supplement, is needed for a T.A.F., whereas all sleeping cars in Spain are first class, and ordinary second class accommodation very much limited or not provided in many long-distance trains. To cater for a limited demand for sleeping accommodation in secondary services, the R.E.N.F.E. and the Wagons-Lits Company run a "mixed" first class car (*coche primo y camas*) consisting half of ordinary first class and half of sleeping compartments in charge of a Wagons-Lits attendant. This development is believed to be unique in Europe; and outside Spain the wages of an attendant for a small complement of sleeping-car passengers might be a difficult problem.

Ticket Collectors' Improvement Classes

TRAINING courses open to ticket collectors throughout the North-Eastern Region have been completed recently at Leeds, Newcastle, Hull, York, and Darlington, at each of which centres a series of eight lectures was given by the district ticket inspectors. The training scheme was evolved as the result of a successful ticket inspector's improvement class established by a district ticket inspector at York three years ago. Over 1,000 railwaymen have attended the course just concluded, drawn from all grades and attending in their own time. Some of the subjects taught were of general interest, such as familiarity with train services and routes, and how to give information. Not only ticket collectors, but booking clerks, cloakroom attendants, and railway police were among those attending the courses, so that the chances of a competent source of information being at hand for the service of North-Eastern Region travellers have been considerably multiplied. The spread of knowledge and ability in these directions is an important method of promoting good public relations, and the numbers attending the classes show a widespread interest in self-improvement in these respects. The syllabus gave full weight to the psychological aspect, with lectures on the important subjects of dress and appearance, and on the method of approach to the travelling public at the barriers and in trains.

The Albula Line

THE main line of the electrified metre-gauge Rhaetian Railway, called the Albula line after the pass it traverses, this month celebrates its fiftieth anniversary. For centuries, the Swiss canton of Grisons lay on the main trade route over the Alpine passes into Italy; but the decision to route the first Swiss trunk railway to the south by the Gotthard instead of by Zurich and Chur, was a serious economic blow to it. To regain traffic the local authorities developed a cantonal system, now the Rhaetian Railway; the most spectacular part of this is the Albula line from Thusis through Filisur and the Albula Tunnel to Celerina, forming part of the main route from Chur to the Engadine and St. Moritz, and opening up the region. Because of its daring construction and magnificent scenery the line soon became famous. At the time of its construction, no other European railway at an altitude of 6,000 ft. could keep traffic running throughout the winter; in this it was helped by the early development of winter sports and the economic dependence on the railway of the Grisons, goods traffic being important. The most marked features of the line are the 3½-mile Albula Tunnel, referred to in our issue of May 23, 1952, and the spiral tunnels near Preda, where the distance is lengthened from 1½ to four miles to overcome a difference in level of over 700 ft.

Microwave Railway Communications

AN experimental microwave radio relay system, installed recently on its Gulf Division by the Atchison, Topeka & Santa Fe Railway, if proved successful and reliable may be of considerable value to railways in the future in areas where normal wire communications are interrupted frequently by storm conditions. It has been established between the port of Galveston and Beaumont, Texas, across a region where direct pole communication is impossible because of deep indentations of the coastline by the sea, and large areas of marshland. The conditions of high humidity in this area are difficult for such communication, and therefore add to the value of the experiment. The pole line previously in use between Galveston and Beaumont parallels the railway and is 315 miles long; the microwave line is 68½ miles long only. In addition to the transmitting and receiving stations at the two ends, there are three repeating stations intermediately; the installation uses frequencies in the 6,575-6,875 megacycle band. The pulse-amplitude-modulated equipment in use provides for eight telephone channels, but the capacity of the system could be increased to as many as 24 channels if necessary.

The chief troubles experienced have been due to fading of the signals, and a very close study of the terrain was necessary, in fixing the position of the repeater stations, in order to obtain the best reflecting conditions for the micro-waves.

The Matheran Hill Railway

ABOUT 60 miles south-east of Bombay and situated 2,650 ft. above sea level is the small semi-hill station of Matheran. It is reached by a 2-ft. gauge light railway 12½ miles long from Neral, a station near the foot of the Bhor Ghat incline on the Bombay-Madras main line of the Central (late G.I.P.) Railway. This light railway was opened in 1907, but is closed for passenger traffic each year during the monsoon. It is one of the most steeply-graded lines in the world worked without a rack or means other than adhesion; the ruling gradient is 1 in 20 compensated for curvature. The sharpest curves have a radius of 60 ft., and the permanent way consists of 30-lb. rails—now being replaced by those of the Indian light standard, 41½-lb., section—on wooden sleepers, mostly cuts from 5 ft. 6 in. gauge sleepers. The line is worked by steam locomotives for both passenger and goods trains, also by passenger railcars; diesel locomotives and additional railcars are reported to be on order. The journey times in both directions recently were 110 min. for steam trains and 90 min. for railcars. Originally a company's venture, the line now has been absorbed into the Central Railway.

Improved Methods in Creosoting Timber

HITHERTO the methods used in the impregnation of railway and other timber with creosote have not always been on the scientific lines demanded by present-day economic pressure and shortage in supply. In selecting the most efficacious process to be used, a careful study of the characteristics of the various species by specially-trained staff is essential. Also, adequate preparation and seasoning before treatment are essential, as creosote can be forced into the cells only if they have been emptied previously of moisture. These maxims and subsequent treatment by the latest approved methods are set forth in a paper entitled "Pressure Creosoting: Seeking Better Results with Old Plants," by Mr. J. T. Cosgrove, of British Railways, read at the recent annual convention of the British Wood Preserving Association at Cambridge. It discusses in detail matters such as the treatment of many individual species, the characteristics of the preservative, the limitations of existing plants, and the different processes. Reference is also made to incising and to the higher temperatures required in treating the more-resistant timbers. Without breaking much new ground, this paper has the merit of stressing the need for obtaining the best results, and of showing how they may be obtained.

Signalling Progress in India

AN article by Mr. H. C. Towers, Chief Signal & Telecommunications Engineer, Western Railway of India, in *The Electrical Journal*, emphasises the progress made there of recent years in signal and communications engineering. There was no interlocking in India until the 70s and for some time the ideas of the various railway authorities on forms of signal and signal aspect differed considerably. Such confusion arose that the then Director of Railway Construction, C. W. Hodson, initiated at the turn of the century an elaborate discussion, eventually published, on the question of establishing a uniform system. From this came the two classes of station signalling and block working known as "A" and "B," long familiar; many years passed before any real departure from them was made. There are now several excellent power and automatic signalling installations, their signal aspects marking an appreciable advance on those met with under the semaphore system. Electric battery lighting is being applied with good effect to mechanical signals at country stations where great risk may at times attach to attending to a failed oil lamp after nightfall.

A.T.C. Programme Recommended

THE double collision at Harrow on October 8, 1952, with its 112 deaths and great destruction of stock, inevitably awakened much public concern. In seriousness it has been exceeded in Great Britain only by one other accident, the troop train disaster near Gretna on May 22, 1915, which was estimated to result—for the figure never was definitely established—in 227 fatalities, of which 12 were civilian. As at Harrow a double-headed express was approaching from the opposite direction and it proved impossible to prevent it from dashing into the wreckage. Fire broke out and 19 vehicles were totally destroyed. No other British accident has given rise to as many as 100 deaths, the highest figure known prior to Gretna and—Harrow excepted—not even approached since, being occasioned by the excursion train runaway collision at Armagh, Northern Ireland, on June 12, 1889, when 80 lives were lost.

The Gretna accident arose from gross carelessness in the signalbox, coupled with inattention on the part of train crews, but it was clear to those acquainted with the equipment in use at Harrow that the chance of a signalling error having been committed was very remote, and they were not surprised therefore when, on the second day of his inquiry, Lt.-Colonel G. R. S. Wilson, Chief Inspecting Officer of Railways, feeling that the gravity of the case called for some preliminary statement from him, announced that the cause of the initial collision was the over-running of all signals by the driver of the sleeping car express from Perth. Indeed, the case can be regarded as fairly simple and straightforward, with no serious conflict of evidence as there was, for example, in the Castle Cary accident of December 10, 1937, rendering it very difficult to come to a conclusion. There was, it is true, some difference of opinion about the degree of visibility obtaining at and near the station, for it was changing from moment to moment. Nevertheless, it was established beyond dispute that at the time the Perth train was accepted the signalman could see appreciably further than the block telegraph regulations required. Not only was there nothing wrong with the signalling apparatus, but no irregularity was committed in its operation. We summarise the report this week.

The accident therefore raised one perfectly clear issue, namely how to diminish the risks arising from human failure on the footplate, a problem appearing to many to be very simple at first sight, but found to be the reverse on closer examination. It involves several degrees of risk, for there are several kinds of signal that can be ignored, and that in turn can take place under widely varying circumstances. It is generally agreed, however, as Colonel Wilson expressly emphasises, that the most important thing is to ensure that a fast running, and often very heavy train shall not fail to act on a distant signal warning, for if it does any resulting collision or derailment can hardly fail to have the gravest consequences. The paramount importance of distant signals in main-line working always has been recognised, which accounts for the care taken to repeat them in the signalbox, provide fogmen at them, check that their lamps are burning, and prove them to be at "caution" when accepting a train. With the perfecting of the light signal for daytime use, one railway adopted the policy of providing colour-light distant signals throughout its principal main routes in order to get as reliable and arrestive an indication as possible.

We find, too, that the distant signal has figured most prominently among the truly extraordinary number of proposals for cab signals and automatic train control brought forward over the years, not only in Great Britain but abroad. No competent person will dispute that to apply what is now termed warning control would raise the general level of safety and be of welcome and appreciable help to drivers, especially in unfavourable weather. In the days of the old companies many interested themselves actively in this question, and although the G.W.R. apparatus, by reason of the large extension given to it from 1929 onwards, came to be the best known and reflected great credit, as Colonel Wilson observes, on those who developed and applied it without pressure from official recommenda-

tions, the work done by other railways was of importance. The G.E.R., for example, had its own contact system, which probably would have been extended but for grouping. On the N.E.R. for many years a number of signals had Raven and Baister's mechanical apparatus for sounding a whistle cab signal. Later Raven's electrical cab signal, which covered distant, stop, and calling-on signals and even gave junction route indications on the engine, was applied to many signals, including the important Newcastle-Durham section, and several locomotives were equipped. Now all but forgotten, this apparatus was an excellent piece of work for its time. The G.C.R. also had apparatus covering both distant and stop signals, not to mention many other inventions, such as the "railophone," of which trials, more or less complete, were made.

Little thought was given then to the question of evolving a uniform system, applicable to all lines, although the considerable amount of inter-working of engines under running powers clearly made the adoption of different designs in the long run undesirable. The 1914 war, however, interfered with progress with these devices, and after grouping other matters claimed attention for some time. Faced with the necessity of making the best use of available funds, some managements considered, whether rightly or wrongly need not be argued, that a greater aggregate increase in safety would be obtained by allocating them to things other than A.T.C., for the time being, while to extend some existing apparatus—say, Raven's—would have encountered appreciable practical difficulties once the larger railway systems had been created. The G.W.R., of course, was comparatively little affected by grouping and was in a position to impose its own methods on the lesser lines amalgamated with it, were it so minded.

The choice of the non-contact method of transmission between track and train by the L.M.S.R., whose pioneer work Colonel Wilson acknowledges to have been most valuable, and later by the L.N.E.R., was, we consider, the wise course, in view of the progress attained in such matters by the time it was taken. No doubt, but for war again intervening, those railways would have done much more than they did. Although scientifically and practically valuable, however, the development of several types of apparatus, once so noticeable, was in fact in conflict with an over-riding principle of necessity which rightly has been accepted by the present national administration, namely that it is indispensable to have one system for the whole country, to which anything earlier eventually must give place. The action of the Railway Executive in working to this end in the way it has, once convinced that the existing ramp contact system could not be universally applied, whether for reasons of clearance or anything else, cannot be called in question. They were bound to find something applicable to any type of engine or train anywhere throughout the lines under their care. To extend something already meeting satisfactorily the desired programme, as a programme, admittedly would be the natural course to pursue and nobody would be justified in turning from it unless circumstances, impartially considered, made it unavoidable or very appreciable advantages were to be obtained thereby. There is no reason to believe that such action was taken without the maturest deliberation of every point involved. Colonel Wilson indeed approves the adoption of the non-contact method as a long-term policy.

It may be regretted that the difficulties met in developing the apparatus now on final extended every-day trial below New Barnet should have absorbed so much time in their overcoming, a point on which there has been some public concern, stimulated by the recollection of Harrow, but Colonel Wilson, who, of course, is in possession of all the facts, is not prepared to say that the period could have been greatly shortened. The Executive, having put forward a comprehensive scheme for extending warning control throughout all important routes in the country, including multiple-aspect areas, where the warning will be given at the approach to any signal showing anything but green, Colonel Wilson recommends that it be proceeded with immediately the present trials are completed to the final satisfaction of himself and all others concerned, and be carried through systematically, independently of other

signalling improvements, which should not be allowed to fall behind. The programme is certainly an ambitious one, but half-measures are of little use in such matters. If the nation, through its authorities, declares for the work to be done it must find the means to effect it, and not only that, it must find annually thereafter the appreciable sum required to maintain the equipment in constant and thorough working order, a problem involving other important considerations than those of finance.

In view of the great interest that attaches to A.T.C., we feel that more details might have been given in the report of the comparative trials and their results, so as to make perfectly clear all the factors considered in taking the decision not to proceed with the extensive and well-tried system in use in the Western Region.

New Zealand Railways Commission at Work

IN a survey of its main activities since it took office at the beginning of the year the New Zealand Railways Commission emphasises that worthwhile savings in expenditure cannot be made at short notice. Spectacular improvements in railway transport, it is stated, are not to be expected, and the size of the industry, with annual earnings of £26,000,000 and a staff of 26,000, is such that the Commission's first year must be devoted mainly to a detailed investigation of the activities of the Railways Department.

As we pointed out in an editorial article in our May 29 issue, most of the larger problems will require careful study before decisions are taken. One of the Commission's first tasks has been to make a close examination of railway finances. During the year ended March 31, 1952, the cost of imported coal and fuel oil, wage increases and extra provision for track renewal brought the gross expenditure to a record figure of £25,195,674, or £1,202,488 more than earnings, which also were a record. In the 1952-53 financial year the overall loss was still greater, at £3,040,164. It was in an endeavour to bridge the gap between charges and rising costs that the Commission last month increased suburban fares by ten per cent and the rates for certain commodities by between five and 25 per cent.

Particular attention has been paid to branch lines and the abandonment of those reckoned to be unprofitable. The branch-line problem was discussed in detail in the report of the Royal Commission last year. The Royal Commission adopted a positive approach, seeking reasons for keeping open rather than closing a particular line. The Railways Commission is also tackling the problem in a realistic way, preferring to examine possible cheaper ways of working a branch before making a specific recommendation to the Government.

The Royal Commissioners recommended that the railways should not continue indefinitely to work the railway ports of Lyttelton, Port Chalmers, Bluff, New Plymouth, Wanganui, Timaru, and Oamuru, and should enter into negotiations with the harbour boards about their future operation. The Commission has already held preliminary discussions with the boards, but some time must elapse before its recommendations are made.

In the tours which it has made of railway centres in both islands the Commission has inspected stations, goods and motive power depots and workshops, and has taken the opportunity of meeting as many railwaymen as possible. It is intended later to confer with local bodies and commercial interests in the places visited. Representations made by staff organisations on such subjects as recruitment, apprenticeship training schemes, improved publicity, housing, and suggested long-service increments have been considered. The railways need to attract more recruits to ease their staff shortage; the average number of staff throughout 1952 was 25,209, compared with 25,673 in 1951. One staff improvement which has already been carried out is the provision of a hostel at Frankton Junction to accommodate shift workers. More motive power staff is required at Frankton and it is considered that the existence of a hostel there will make the work of footplate men in particular more congenial.

Research and Productivity

THE sixth annual report of the Advisory Council on Scientific Policy (Cmd. 8874) is devoted to a special study of "The Exploitation of Science by Industry." This choice of subject was guided by the widely-held view—most commonly expressed in comparisons of American and British practice—that "technical backwardness" in large sections of British industry is responsible for part of our economic difficulties. The study was undertaken at the request of Lord Woolton when Lord President of the Council. It is concluded that there is need for a great increase in the number of scientists and engineers employed in British industry, and of improvement in their average quality. For such a change to take place it is necessary not only to improve the facilities for technological education, but to initiate a change of heart in some sections of industry so that there will be a demand for the scientists and engineers produced. If American and Continental practice is any guide, says the report, scientists and engineers are urgently needed not only in the laboratories and workshops, but also in the board rooms of British industry. The report recognises the limits set to development by restricted capital expenditure, and affirms that the most effective single measure which would conduce to a greater exploitation of science by industry would be a significant increase in the volume of investment.

The importance of research to the railways was endorsed in the Stanier report of 1951, which reviewed the position in the light of the task laid on the British Transport Commission by the Transport Act of 1947 of undertaking research activities. The Director of Research is responsible to the Chairman of the Railway Executive, so that the organisation implements the requirement of research representation at high level which the Advisory Council's report has noted with approval elsewhere and recommended strongly for industry in this country.

The London Transport Executive also has its Director of Research, and laboratories at Chiswick which undertake work on behalf of departments and give assistance in investigations which the departments may be equipped to pursue themselves.

South Australian Railways

THE report for the year ended June 30, 1952, of the South Australian Railways Commissioner, Mr. R. H. Chapman, shows that increases in wage rates and costs of materials totalled £2,530,301; increased freight rates and fares were estimated to produce approximately £1,000,000 more. As, however, the State Government contribution was increased to £4,250,000, the deficit was reduced to £144,341, compared with £1,171,568 for the previous year.

Some of the principal results for 1950-51 and 1951-52 were:—

	1950-51	1951-52
	(thousands)	
Total train-mileage	6,380	6,944
Passenger journeys	17,178	18,269
Goods gross tonnage	3,816	4,376
	(£ thousands)	
Coaching receipts	1,418	1,656
Goods receipts	5,335	7,102
Total receipts	7,358	8,511
Total working expenses	9,793	13,305

In spite of the increase in rates and fares, Treasury subsidies will have to be still heavier unless railway charges are advanced in line with continually rising costs. Charges for passenger and freight transport have not quite doubled in thirteen years, yet average wage rates and fuel prices have gone up by three-and-half times.

Freight and livestock traffic continued to increase; the average earnings per ton mile were 55 per cent more than in 1946. On the other hand, average hourly rates paid to staff were 162 per cent more. During the year a system by which agents were able to load wagons for transport between Adelaide and Melbourne, at rates based on tonnage, irrespective of railway classification, was introduced. Ten agents co-operate in handling traffic by this method. Another innovation was the carriage of motorcars in double-deck wagons between Adelaide and Melbourne;

hitherto only motorcar bodies had been conveyed between the two capitals in this manner.

The easing of the staff shortage and the introduction of more locomotives made possible a considerable increase in the movement of coal from Leigh Creek and concentrates from Broken Hill. Fourteen air-conditioned sleeping cars and coaches are now in use on the "Overland" between Adelaide and Melbourne. Three 1,760 main line diesel-electric locomotives, with motive power equipment supplied by the English Electric Co. Ltd., were brought into service and are used in pairs to haul the "Overland" between Adelaide and Serviceton, and freight between Mile End and Taillem Bend in 700-ton train loads. The report refers to the economies in working which the diesels are yielding and says that their use is increasing track capacity of the line through the Adelaide Hills and will postpone further doubling for years.

The quantity and quality of New South Wales coal received was quite inadequate, and black coal imported from overseas and increased quantities of fuel oil had to be used. The expenditure on coal and oil fuel used in steam locomotives increased from £1,515,000 in 1951-52 to £2,274,000.

In four more railcars diesel engines were substituted for petrol engines. Work began on 14 railcars of a new type, for country services. A total of 105 broad-gauge and seven narrow-gauge wagons was built in the Islington shops of the railway, and work put in hand on 430 more. Contracts were let for 190 broad-gauge and 120 narrow-gauge vehicles. Fifty-three containers for the Adelaide-Sydney service were delivered, bringing the total to 108.

The work of converting to 5 ft. 3 in. gauge the remaining 3 ft. 6 in. sections in the south-eastern part of the State made progress. Construction of a diesel-electric locomotive depot at Mile End was begun. The Public Works Standing Committee recommended electrification of the Adelaide suburban lines and it was expected that legislation would be introduced later.

Trends in U.S.A. Railway Operations

IT is difficult to reconcile current reports of productivity in the United States with the downward trend of railway wagon loadings. During the 15 weeks to April 11, the number of wagons loaded was 10,310,200, a decrease of 427,830, or four per cent from 1952. Exceptionally, ore loadings of nearly 358,000 were up ten per cent; the steel works were busy and the Great Lakes navigation opened earlier than usual on March 30, so that to April 13 the movement of ore from Lake Superior ports was 2,624,388 tons compared with 1,015,364 tons last year. Coal loadings of 1,762,655 wagons were 363,880, or 17.1 per cent below 1952, reflecting a fall of nearly one-fifth in bituminous coal output.

For the months of January and February, total operating revenues were \$1,676 million, a decrease of \$36,250,000, or 2.1 per cent. Freight revenue was down 1.4 per cent and passenger revenue 7.6 per cent. By the middle of February the number of employees was reduced by 33,820, or 2.7 per cent. Operating expenses for the first two months of the year were cut by 3.9 per cent and the 1952 operating ratio of 78 per cent became 76.5. Net railway operating income rose from \$142,000,000 to \$157,000,000 or by 11.1 per cent, but many railways did not share in the improvement.

The tendency was for the coal roads to fare badly, especially in the Pocahontas Region. In consequence the Eastern lines had a return of only 3.8 per cent on property investment, compared with a return of 5.26 per cent in the Southern District and 4.2 in the Western District. It is disquieting that the three largest companies in the East—the Pennsylvania, New York Central, and Baltimore & Ohio—all earned less revenue though freight rates were higher than in the early months of 1952, while the Santa Fe and Southern Pacific, operating in the Central Western Region at a low ratio of expenses to receipts, were able to increase their earnings.

LETTERS TO THE EDITOR

(The Editor is not responsible for opinions of correspondents)

The Harrow Accident

July 9

SIR,—It must have struck you as extraordinary and incredible that two such experienced men as Driver Jones and his fireman should have failed to see, and have passed, three signals at danger.

The obvious explanation is that the engine brake had failed. The train was running late and the driver was trying to make up time by delaying applying brakes until close on the distant signal. (The time factor from there to the point of collision was only about 20 sec.) Finding that the brake would not work, the driver naturally made every effort to correct it. That he eventually succeeded in doing so was evidenced by the heavy jerks experienced a moment before the collision. The brake was afterwards found to be hard on and the driver dead with his hand on the lever.

A serious contributing factor to these numerous accidents (quite 30 have occurred since the war) has been the failure to correct the anomaly of allowing drivers to pass distant signals at danger, thereby violating the principle that there must be two "Stop" signals between one train and the next.

Instead of the adoption of this simple remedy, outer distant and outer home signals have been introduced. Now it is proposed to install electrical devices all over the country, although it is to be questioned whether they will be any use if the engine brake has failed.

If, however, the distant were a "Stop" signal, the driver would be obliged to apply his brake at least a mile before reaching it. If he found anything wrong with it, he would have time to sound the "alarm" whistle for the guard to cut the vacuum brake on the train—and so save the situation.

Yours faithfully,

E. R. B. ROBERTS

Eynesbury, Hunts

French Train Working

July 5

SIR,—The seven journeys, totalling nearly 600 miles, which I made during a recent holiday in France, produced the following late arrival statistics: 0, — 1 min., 0, 0, — 1½ min., 0, 0. All departures were on time. The first run was on the electrically-hauled 14.30 (second portion) from Paris Montparnasse to Le Mans, scheduled at 66 m.p.h. start to stop; the second, third and fourth were on semi-fast steam-hauled trains of more than moderate weight between Le Mans and Nantes, Nantes and Angers and Angers and Tours, calling for averages approaching 60 m.p.h. between stops; the fifth was on Train 8 from St. Pierre des Corps to Paris Austerlitz, booked over the 145.3 miles at an average of 66.8 m.p.h., and the last two were on semi-fast electric trains between Paris, Lyons and Fontainebleau, also smartly timed.

The highlight of the trip to Le Mans was the recovery of 7 min. lost by a long and severe p.w.s. near Gazeran, resulting in a net average speed of 70.2 m.p.h. start to stop; this, too, with a load behind our 2-D-2 locomotive of 530 tons full. Before the check and again, before the service slack at Chartres, maxima of just on 80 m.p.h. had been attained, and the run concluded with a dash for Le Mans with an average of 77 m.p.h. for 50 consecutive miles and a top speed of 81½. There was no vestige of a signal check from the first portion running 5 min. ahead with a load roughly equal to ours.

With train 8, hauled by 2-D-2 No. 5539 and loaded to nine vehicles, 330 tons full, a p.w.s. slack to 20 m.p.h. at La Chapelle St. Mesmin and a slight signal check at Cercottes, just after recovering from the prolonged service slack through Les Aubrais, were responsible for losses totalling 5½ min., so that our net average overall speed, allowing

for the 1½ min. early arrival, was 70.8 m.p.h. Before all this had happened, we averaged 78.5 m.p.h. between Amboise and St. Ay, reaching 83½ at the latter station, and then, once our troubles were over, we ran from Chevilly to Brétigny (48 miles) at an average of 79 m.p.h., speed ranging between 74½ and 84, except for a brief fall to 68½ on the adverse stretch near Etampes.

For the S.N.C.F., of course, all the foregoing is mere routine.

Yours truly,

J. E. L. SKELTON

9, Keble House, Manor Fields, S.W.15

British Railways Timetables

July 1

SIR,—With regard to my letter of June 15 on this subject, my attention has been drawn to some local timetables published by British Railways, in particular to an excellent one covering the North Staffordshire lines which contains a very clear route diagram as well as the timetables of bus routes that act as feeders. The idea behind my suggestion appears therefore to be already established practice. There are in addition the pamphlets giving the summary services between large towns. I was aware of these, but they come outside the province of local timetables.

I understand that the publication of the Continental timetables, a copy of which reached me shortly after my previous letter, was delayed awaiting information from certain Continental railways.

Yours faithfully,

P. W. B. SEMMENS

52, Belle Vue Grove, Middlesbrough

Availability of Season Tickets

July 17

SIR,—In your issue of July 10, the Public Relations & Publicity Officer of British Railways, Eastern Region, states that "... all season tickets, including those available from stations north of Finsbury Park to Kings Cross and beyond were made alternatively available over the lines of the London Transport Executive between Finsbury Park and Kings Cross (via Arsenal) ..." and that this facility has existed since March 1, 1941. This statement is incorrect in so far as my season ticket is concerned during the past nine years; my quarterly ticket between Brookmans Park and the Bank has been clearly marked "via Finsbury Park and Northern City Line only." The alternative routes available, which I am precluded from using are: (a) Finsbury Park, Arsenal, Kings Cross, Bank (L.T.E. Piccadilly and Northern Lines); (b) Finsbury Park to Kings Cross (Eastern Region), thence by L.T.E. to the Bank via the Northern Line; and (c) Finsbury Park to Moorgate (Eastern Region), thence by L.T.E. Northern Line to the Bank.

On occasions when I have used alternative routes (a), (b), and (c), I have always been surcharged by the ticket inspectors in both directions. Users of these Eastern Region suburban lines would welcome the removal of these anomalies.

Yours faithfully,

L. G. JENNINGS

3, Calder Avenue, Brookmans Park, Herts

MEMORANDUM ON VALUES FOR PROPERTIES OF HIGH-CONDUCTIVITY COPPER.—Because of anomalies in certain British Standards dealing with annealed and hard-drawn high-conductivity copper, the British Standards Institution has issued a memorandum on "Values for the Properties of High-Conductivity Copper," to form a common foundation on which to base future British Standards and revisions of existing standards. Copies of this standard (B.S. 1989) may be obtained from the British Standards Institution, Sales Branch, 24 Victoria Street, S.W.1. Price 2s. 6d.

THE SCRAP HEAP

Hot Air

On a hot weather morning, on May 5, when a Central Railway restaurant car was standing in the yard at Allahabad, unknown persons removed and carried away the dynamo. The loss was detected when the car was attached to the Calcutta-Bombay Mail and fans failed to move. In the absence of a replacement the car ran through from Allahabad to Bombay, 840 miles, without lights or fans.—From *"The Indian Railway Gazette."*

Railway-Owned Premises Unlet

The experiment made in April of erecting bird boxes on telegraph poles at intervals along the railway line between Forsinard and Kinbrace, Sutherland, has not been successful. Not a single pair of birds has taken up residence. One explanation is that the entrance was too small for the average bird and that there was no platform on which a questing bird might alight for a preliminary inspection. The idea of bird boxes originated in Scandinavia. They were intended to promote study of the migratory habits.

Aches and Trains

Something will have to be done to bring railway clerks up to date in modern jargon. The sad story is going the rounds in Johannesburg of a booking clerk who refused to issue a ticket for the "Duodenal Express."

"We have no such train," he told the customer.

"Why, I travel by it regularly. It is the service you run for the wealthy, the good eaters, and the comfort-hungry, in fact the people in the ulcer league," the customer protested.

"Well, I have never heard of it," the clerk persisted.

The customer explained that the train was also known as the "Blue Train," and this time he was sold a seat—From the *"South African Railways Magazine."*

Railway Road Links

It is just 50 years since the first motor-coaches associated with railways were put into public service. They were two 16-h.p. Milnes Daimler 22-seater wagonettes.

These vehicles had been bought by Sir George Newnes, who had strongly supported and backed the Lynton & Barnstaple Railway... and ran in June, 1903, from Ilfracombe to Blackmoor Station, L. & B.R., by way of Berrydown, thus avoiding the long gradient of the road through the village of Combe Martin.

But within a week or two the police had come down on the service and secured a conviction against it for running at a speed exceeding 8 m.p.h.

Sir George was convinced that the horse-coach owners would oppose his

plans by any means. A plan for a motor service between Helston and the Lizard instead of a light railway was being worked out by the G.W.R. The vehicles were sold to the company and in August, 1903, as the first railway-owned motor-buses, they became the precursors of the present network of joint services.—From *"The Manchester Guardian."*

Helicopter Blues

(Conversation piece for the Waterloo lions about recent experiments at South Bank.)

The long lean lion of Waterloo
Murmured "What next will these mortals do?"

"Life's getting beyond a joke to-day
"With such goings-on across the way."

The sleek red lion, infirm and old,
And, rather, I fear, the reverse of bold,
Said "It's bad enough being plagued by trains,
"Goodness knows what will happen
with these ——— planes!"

The long, lean lion, the railway's pride,
Reflected awhile, then sadly sighed
"I've heard a rumour, but I've no proof
"That the blighters may land upon our roof."

"I definitely regard as grim
"The Transport Minister's latest whim,
"But why inflict upon *our* station
"These ups and downs of aviation?"

"But still, when everything's done and said,
"It all seems rather above one's head;
"We couldn't in any case say them 'nay',
"We're always looking the other way."

The fat one lifted his sightless eyes
And, uselessly scanning the unseen skies,
Muttered "I take the dimmest view
"Of most things that happen at Waterloo."

The lean one answered "I sadly fear
"We both have just about had it here,
"This must be the death-knell of the rail
"And the final twist of the lion's tail."

"You can't imagine how daft I feel,
"Perched helplessly on this crazy wheel,
"While noisy, out-sized dragonflies
"Play 'noughts and crosses' about the skies."

But the progress gods in their secret lair
Pressed on with their plans for rail and air.

The lions gnashed their old teeth in vain
And London, as usual, went home by train.

A. B.
E 2

Engine Headboard as Poster Site



Headboards advertising the film "A Queen is Crowned" were fitted to engines of all Jamaica Government Railway passenger trains during the run of the film at a Kingston cinema, and attracted much attention in country districts

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

SOUTH AUSTRALIA

Railcars on Trans-Australian Line

The Commonwealth Railways have now had more than a year's experience of the working of the three RDC-type 85-ft. diesel-hydraulic railcars obtained from the U.S.A. These railcars, which have been stationed at Port Pirie, at the eastern end of the Trans-Australian line, travelled 126,033 miles, carried 42,330 passengers, and earned an operating profit of \$32,128 in their first year; with the steam locomotives previously used on the same duties it is estimated that there would have been a loss of \$220,268.

Although much of the work performed by these cars has been on short-distance journeys from Port Pirie, they have also been used to convey special parties along the full 1,108-mile length of the Trans-Australian line between Port Pirie and Kalgoorlie.

VICTORIA

Moe Spur Line

The spur from the main Gippsland line at Moe to the new marshalling yards at Yallourn, about five miles away, is nearing completion. It will be used in place of the line from Yallourn to Moe, via Hernes Oak and the Haunted Hills. Its gradients of 1 in

110 for up traffic compare with the 1 in 50 on the Hernes Oak route.

About 1½ miles from Moe the new line crosses the old Melbourne-Sale coach road, and passes close to the Newborough township. Four miles from Moe, it skirts the Latrobe river, where the embankments are 70 ft. high, and passes through a cutting 50 ft. deep. Excavations in this area disclosed the presence of high-grade brown coal deposits reported to be of considerable thickness.

CANADA

Record Grain Export

The Canadian National Railways unloaded more wagonloads of Western grain for export during May than in any similar month in the company's history, according to Mr. J. R. McMillan, Vice-President, Western Region, C.N.R.

Two-Way Radio at Turcot Yards

A two-way radio system which includes walkie-talkie sets to link all wagon marshalling operations at Turcot Yards, Montreal, is being installed experimentally by the Canadian National Railways to speed freight services.

The frequency modulation installation enables orders to be delivered instantly to engine crews wherever they are situated on the 72 miles of track in the yards,

through which 5,000 wagons pass daily. Two combination microphone and loud-speaker units are mounted on the front of each locomotive. These units normally function as receivers, but a yard foreman can transmit a message to any point in the yard, including the cab of the same engine, by pressing a switch on the foot-board.

UNITED STATES

New York-St. Louis Service

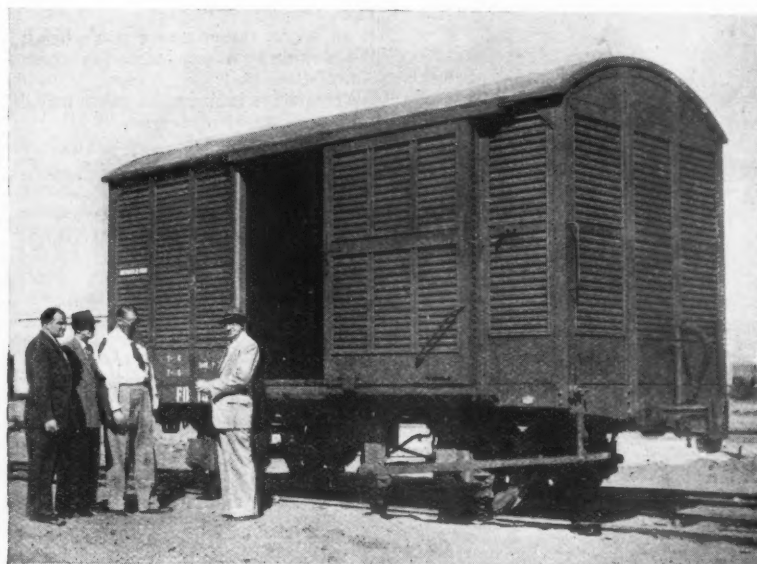
From April 26, when daylight saving time began in the U.S.A., the Pennsylvania reorganised its night service between New York, Indianapolis, and St. Louis. The all-Pullman "Spirit of St. Louis" and the all-coach "Jeffersonian" streamliners were merged into one train, leaving New York at 6.45 p.m. and reaching St. Louis at 2 p.m. the following day; the start is thus 35 and 30 min. later than before and the arrival 50 and 20 min. later. In the reverse direction, departure from St. Louis is at 1.45 p.m., 65 min. later than the previous "Spirit of St. Louis" and 45 min. later than the "Jeffersonian," and the New York arrival is at 10.35 a.m., 60 and 30 min. later respectively. To relieve this train, a new Pullman and coach streamline train, the "Indianapolis Limited," is running in the old times of the "Spirit of St. Louis," from New York at 6.10 p.m., reaching Indianapolis at 8.45 a.m.; it returns at 5.45 p.m., and is into New York by 10.20 a.m. By this rearrangement, 480 train-miles are saved daily.

The I.C.C. and Railway Brakes

As an outcome of the accident to the "Federal" express of the Pennsylvania Railroad, which, as reported in our April 3 issue, overran the buffers at Washington Union Station on January 15, and caused considerable damage, the Interstate Commerce Commission is seeking from the United States Congress more detailed authority over train brakes. It desires the Safety Appliance Act to be amended so that it may be able to prescribe rules, standards, and instructions for the installation, inspection, maintenance, and repair of train brakes.

In this connection, Division Three of the I.C.C., after inquiry into the Washington wreck, has reported that the angle cock of the brake connection between the third and fourth coaches of the "Federal" was knocked into the closed position, while the train was running, by coming into contact with the car underframe, so that the locomotive driver had control of the brakes on the first three coaches only of the 16-coach train. The I.C.C. has recommended that coaches equipped with tightlock or similar types of coupler shall be altered in such a way that it shall be impossible for the bottom cross member of the

New Goods Stock for Western Australia



At the handing over of the first of 1,000 covered vans being built by the Commonwealth Engineering Co. Ltd. for the Western Australian Government Railways. From left to right, Messrs. S. McKinley, Works Manager, Commonwealth Engineering Co. Ltd.; T. Marland, Chief Mechanical Engineer, C. W. Clarke, Assistant Commissioner (Engineering); and C. Gates, Assistant Chief Traffic Manager, Research & Investigation, W.A.G.R.

buffer pocket portion of the underframe to come into contact with the angle cock.

Mr. F. C. Dumaine, President of the New York, New Haven & Hartford Railroad, to which the car immediately responsible for the accident (No. 8665) belonged, has given his opinion that the cock could not have been subjected in the way held by the I.C.C. to sufficient pressure to turn it off, especially as such pressure would need to be in an upward direction. As a precautionary measure, however, all angle cocks on this type of New Haven stock are now wired in position to ensure no recurrence of this casualty.

ITALY

Upgrading of Coaching Stock

The practice of upgrading coaches to overcome temporary shortages of certain classes of coaches is still widespread, although efforts have been made by headquarters to counter it, as reported in our July 23, 1952, issue. An order in stronger terms has now been made from Rome prohibiting this misuse which, it states, persists mainly in the south. It adds that there is now no necessity, for instance, to upgrade third-class coaches to second-class, as sufficient coaches of all classes are available.

At the same time, new regulations have been issued covering the composition of passenger trains, particularly

long-distance and high-speed trains from Rome to Milan, Turin, Naples, Bari and Reggio Calabria. Main line coaches allowed to run at speeds of 62 m.p.h. and more may not be marshalled in secondary suburban trains, nor may four-wheel coaches run on main lines where high speeds are the rule.

FRANCE

Postwar Reconstruction

Of the fr. 444,000 million of damage to S.N.C.F. structures and permanent way, which occurred immediately before Liberation, all but fr. 75,000 million worth had been made good by the end of 1952. By this time, however, capital restrictions had caused the rate of reconstruction to fall to fr. 9,000 million a year and there seems little likelihood of this rate being exceeded in the immediate future.

S.N.C.F. Staff

The total personnel of the S.N.C.F. at the end of 1952 was 410,800 compared with 424,700 in 1951 and 480,200 in 1947. The greatest percentage reductions took place in the headquarters' staff of the regions—21.4 per cent between 1947 and 1952. During the same period the operating staff of the regions decreased by 16.5 per cent, motive power and rolling stock staff by 15.8 per cent and civil engineering staff by

only eight per cent. At system headquarters the reduction in staff between 1947 and 1952 was just over five per cent.

BELGIUM

Brussels Junction Railway

Works still to be completed north of Brussels Nord Station include four road bridges which must await the removal of the Allée Verte Station. The few trains still using that station will be diverted partly to the junction line, and partly to the western loop line. At the Midi Station the new S.N.C.B. administration building and the bus and tram station are under construction. When the bus and tram station is completed, platform tracks 10 to 18 can be linked to the junction line. The laying of four more tracks must await the construction of the postal sorting office, which is in the planning stage only. Work is also in progress on the part of the station intended for new luggage and customs offices.

SAAR

Electrification

There are no electrified lines of the Saar Railways. In rebuilding war-damaged bridges, however, provision has been made for equipment which might be necessitated by possible electrification.

Publications Received

Management under Nationalisation. London, 1953: Acton Society Trust, 39, Welbeck Street, W.1. 8½ in. × 5½ in. 79 pp. Price 7s. 6d.—An examination is made of the conditions to which the operational manager has to adapt himself in nationalised industry, taking four examples and comparing their present circumstances with the background they knew in private industry. There is also an analysis of policy and practice in large-scale private organisations and in the General Post Office. The concluding chapter suggests the necessity of special training to promote co-operation and confidence between all levels of an organisation. An editorial note on the book appears on another page this week.

Metal Industry Handbook & Directory. 1953. London: Louis Cassier Co. Ltd., Dorset House, Stamford Street, S.E.1. 9 in. × 6 in. 456 pages.—The *Metal Industry Handbook & Directory* now in its 42nd year of publication is a comprehensive reference book for all those whose interests bring them into the non-ferrous metal industries. Containing up-to-date information on the properties of the newer, as well as the more familiar metals, an extensive section is devoted to summaries of British Standard, aircraft material and D.T.D. Specifications, it also includes a section on the chief metal finishing processes, and data regarding all the common rod,

bar, sheet and strip products. The compression into one volume of a continually increasing mass of data and information covering all the non-ferrous metals provides a useful reference. In this revised edition, re-arrangement of the textual matter, particularly that applying to British Standard Specifications, has made reference easier, and the inclusion of details of the newer metals has widened the scope. The directory for buyers is a useful section of the handbook, and gives a wide range of producers, stockists, and factors of all basic metal products, metalworking machinery and so on. This handbook is available only with the weekly journal *Metal Industry* at a combined subscription of £3 5s.

Self-Priming Centrifugal Pumps.—Details of types of Rapier self-priming centrifugal pumps are given in a series of illustrated leaflets recently issued by Ransomes & Rapier Limited, of Ipswich. Four types are available, "4P25" and "37," "3P18," and the "2P10." Their respective capacities are 37,000, 18,000 and 10,000 g.p.m. All types are available with petrol, diesel, electric, or independent drive, and are available mounted on steel or pneumatic road wheels.

Symposium on Aluminium Alloy Castings.—A symposium was held at Birmingham and London on November 6th and 11th, 1952, respectively, under the ægis of the Aluminium Develop-

ment Association, who has recently published the various papers presented, in book form. The papers covered a wide range of interest within the field of aluminium alloy castings, including a survey of research work being undertaken, the assembly of aluminium components by welding, and design factors. The concluding paper provides a concise summary of the trends for aluminium castings in various fields of application, both new and established. The publication is available on application to the Aluminium Development Association, 33, Grosvenor Street, London, W.1.

Gas-Fired Furnaces.—A series of illustrated brochures has recently been issued by the Incandescent Heat Co. Ltd. giving details of gas carburising, heat treatment, and gas producer equipment. Gas carburising has the advantage that the pay load is 80 per cent of the gross load, and does away with the need for packing the materials in a heat-resisting box with carburising compound; the furnace is hermetically sealed to retain the carburising gas, and exclude the infiltration of air. The A.G.M. gas producer is automatic in action, and will convert solid fuel into hot-transmittable gas. With bituminous coal, gas of approximately 150 B.Th.U. per cu. ft., n.t.p. can be generated at any desired rate from 22½ therms to 7 therms; the coal consumption is from 240 lb. to 80 lb. per hr. Gasification rate can be instantly changed by operation of a single master valve.

Development of Lightweight High-Speed Train Design

Trial runs of coaches built by Pullman-Standard on lines similar to those of the A.C.F. Talgo trains for Spain

IN 1948 models were exhibited at the Chicago Railroad Fair of light-weight rolling stock designed by the Research Consultant to the Chesapeake & Ohio Railway for safe operation at speeds up to 150 m.p.h., and based on a Spanish prototype. The principles adopted were described in our March 18, 1949, issue, and have been embodied in the Talgo trains built for the Spanish

A further prototype passenger vehicle has an overall length of 31 ft., a height above rails of 10 ft. 5 in., a floor level $2\frac{1}{2}$ ft. nearer the rails than the average of standard cars, a centre of gravity (empty) 3 ft. $2\frac{3}{8}$ in. above rail top compared with 4 ft. 7 in. in a standard car, and a seating capacity for 28 passengers.

As in the Spanish Talgo train, each vehicle has only one pair of wheels, at

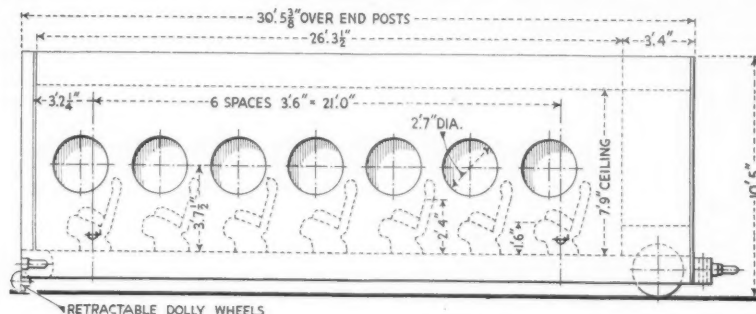
ventional trains. Several such cars would be spaced at intervals in a full-length train of the "Train X" type.

Weight reduction of the experimental stock was accomplished by transferring most of the mechanical equipment now carried underneath standard cars to the locomotive, simplifying design, and using lighter construction materials such as aluminium alloy for the superstructure, high-strength steel for the underframe, a tubular centre sill, and plastic materials for inside finish. The car wheels have rubber-cushioned centres to absorb shocks, and suppress noise.

Passenger Accommodation

Circular windows affording good visibility are set in plastic panels inserted in the car frame in a way that permits the entire unit to be removed from the outside. Window drapes that slide horizontally on a concealed hanger take the place of customary roller blinds. There are no overhead luggage racks; instead, the space under each seat is enclosed to form a receptacle for the less bulky hand luggage and each car has two lockers at one end for larger pieces. Additional locker compartments are provided in the "entrance" cars.

General illumination is by fluorescent tubes, and individual reading lamps of aircraft spotlight type are recessed in the seat backs. Heating, air conditioning, electricity, and water will all be supplied from the locomotive. Two train-lines run the full length of the train, providing a circulating water system. These lines are well insulated and will take care of the heating and cooling of the cars. For heating, the locomotive will supply hot water up to 150° F., depending on the outside temperature, and the water will return to the locomotive on the opposite side of the



Side elevation of coach showing retractable dolly wheels at front and main wheels at rear

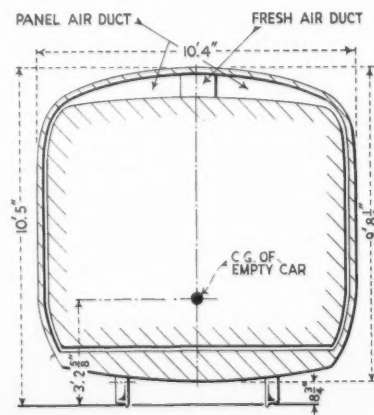
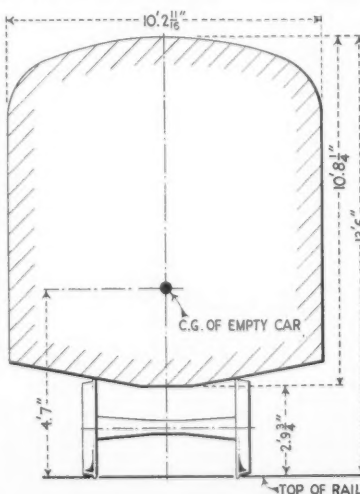
National Railways by the American Car & Foundry Company. More rolling stock on similar lines, but intended specifically for American railway requirements, has been built for test purposes by the Chesapeake & Ohio Railway and the Pullman-Standard Car Manufacturing Company in collaboration, and it is these Pullman-built vehicles which are the subject of the present article.

The motive behind these lightweight vehicle designs has been the high ratio of train weight to passenger load in conventional vehicles, with accompanying high operating costs. With this factor in mind Mr. R. R. Young, Chairman of the Chesapeake & Ohio Railway Company, convinced the other executives and design engineers of his system in 1947 that coaches of an entirely new type should be built. The objective sought was reduction of construction, operation, and maintenance costs to a safe minimum, at the same time incorporating the latest facilities.

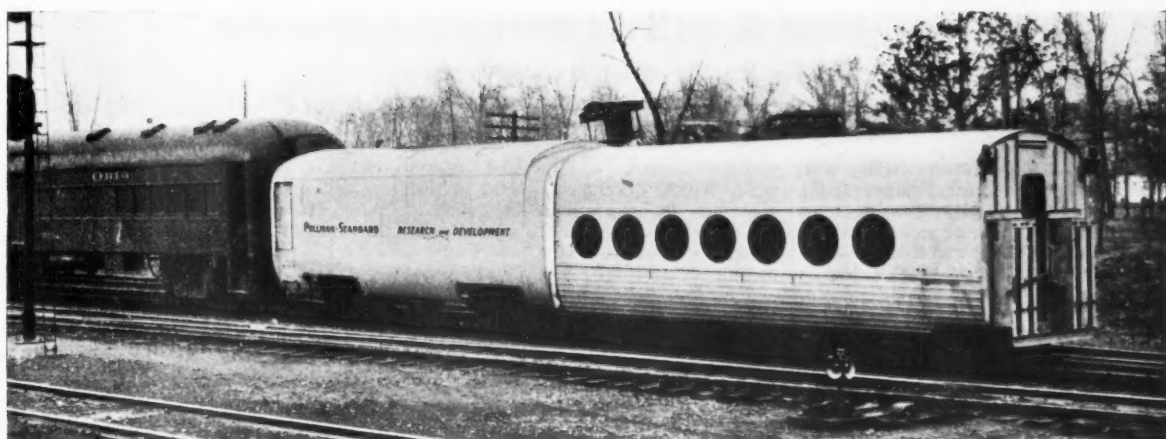
The Pullman-Standard Car Manufacturing Company was called on to collaborate in research and development work in 1950, and produced a prototype vehicle, which was taken on its first trial run in northern Indiana in February, 1951. On later short trial runs, when officers of 15 major U.S. and Canadian railways were among the travelling observers, speeds up to 105 m.p.h. were attained. It is reported that the car rode so smoothly at the higher speeds that opened bottles placed on tables neither shifted position nor spilled any of the contents.

the rear, the front end being supported by the coach ahead. The railway envisages a complete train ("Train X") being made up of 41 cars, including "entrance" cars, baggage, express and mail cars, passenger coaches, diners, and an observation car.

Such a train would have revenue seats for 496 passengers compared with 452 in a comparable standard train, but would weigh only one-third as much. The "entrance" cars alluded to are designed for convenience of passengers, crew and service workers in entering and leaving a train at stations where platforms are at floor level of con-



Cross-sections of standard and lightweight ("Train-X") coaches



"Train-X" coach on test run, attached to rear of special transition car having standard-height coupler at front and low coupler matching the lightweight high-speed stock at rear

car in a similar pipe. During the warm season, the same pipes will carry water cooled in the locomotive by means of a refrigerator unit. It will circulate through the train in a fashion similar to the heating system. In addition fresh air intake is blown into a centre duct, which runs over the ceiling. This air is distributed to the passenger space.

The coaches described and those of the A.C.F. Talgo train are similar in having one pair of wheels each for running on the rails and a set of retractable dolly wheels to support the vehicles

when standing alone or being shunted. Their suspension systems differ in that the Pullman-Standard stock has a compressed air system for tilting the body on curves, and standard axles; while the A.C.F. coaches have coil springs to give body inclination, and independently rotating wheels.

Hot or cold water for heating or cooling the Pullman-Standard coaches is supplied from the locomotive, as has been described already. In the A.C.F. Talgo train air-conditioning units are located in the "entrance" cars, and con-

ditioned air is distributed to adjacent vehicles through ducts. The Pullman-Standard couplers are fully automatic and connect simultaneously the water and air brake lines and electric cables, while the dolly wheels are raised into the locked position by the action of coupling. Conversely, a car cannot be uncoupled until the dolly wheels have been lowered.

The length of the Pullman-Standard coaches is 30 ft. 6 in., compared with the 26 ft. 8 in. of the vehicles in the A.C.F. Talgo train.

C.P.R. Stainless Steel Stock

Vista Dome observation cars included in order for 155 coaches

THE Canadian Pacific Railway has placed an order worth \$38,000,000 for 155 lightweight, stainless steel, streamline coaches with the Budd Company.

The order includes 36 observation cars of the Vista Dome type, popular in the United States, which will enable the Canadian traveller and the American tourist to enjoy to the full the fine scenery on the Canadian Pacific route through the Rockies. They have a 24-seat upper level, enclosed with heat-resisting, glare-proof glass, which allows full vision in all directions. Eighteen of the cars are sleeper-lounge observation and the other eighteen are coach-buffet observation.

There are 30 day coaches equipped with reclining seats having full-length leg rests, and 71 sleeping cars ranging from the standard section through duplex roomettes, roomettes, bedrooms, compartments to drawing rooms. These rooms are designed to provide easy-chair comfort during the daytime; they have "Murphy-type" beds for night use. Enclosed private toilet facilities, as well as separate washing facilities, are provided in bedrooms, compartments and drawing rooms.

The 18 dining cars in the order have electrical refrigeration and propane gas cooking units to cater for passengers who want regular dining car service. In addition, each dome coach includes a

buffet section providing restaurant service at lower prices.

Mr. N. R. Crump, Vice-President, C.P.R., said that the coaches, the equivalent of fifteen complete trains, were being built after long and exhaustive studies by the company to determine the rolling stock best suited to the needs of the public and to keep pace with the rapid growth of Canada. Although they had not been unmindful of the pressing need to modernise their passenger stock, they were not able to build or order new coaches during the war, and after the war it was their first and most urgent duty to provide new freight stock to meet the demands of the country's fast-expanding economy.

JUGOSLAV PASSENGER FARE REDUCTIONS.—Reductions in passenger fares in Yugoslavia as from May 1 vary as to distances and range from 15 to 40 per cent (for distances of 500 km. and over). Foreign tourists holding tourist visas are granted an additional flat reduction of 25 per cent.

ASSOCIATION OF CONSULTING ENGINEERS.—Total membership of the Association of Consulting Engineers for the year ended April 30, as shown in the report of the Council, was 347. It is pointed out that there were only 17 new members during the year as against an average of 35 for

the four preceding years, and the Council considers it very desirable that efforts should be made to increase the number of suitable candidates who are recommended for membership. The association has taken steps to urge on the Press the news value and interest to the public of large or unusual engineering projects, with the suggestion that more space should be accorded to them than is usual and that the names of consulting engineers and contractors should be quoted. It is noted elsewhere in the report that the engineering manpower employed in Government Departments, particularly in the regional

and local offices, which might well be replaced by consulting engineers, suggests a direction for the exercise of economy.

OWNERSHIP OF "ABC RAILWAY GUIDE."—Kelly's Directories Limited has acquired the whole of the ordinary share capital of Thomas Skinner & Co. (Publishers) Ltd., publishers of the "ABC Railway Guide," from Sir Hewitt Skinner, Bt., Chairman of the company, and from Mr. T. Gordon Skinner. The "ABC Railway Guide," which achieves its centenary this year, was purchased by Sir Hewitt Skinner for the firm in 1937.

Coal-Fired Gas Turbine for Locomotives

Results of tests emphasise importance of ash separation

SOME valuable information has been made public recently concerning the progress achieved in the United States towards the evolution of a coal-fired gas turbine suitable for use in a locomotive. The authority sponsoring this test is Bituminous Coal Research Inc., of Cincinnati, which has the support of several railways, particularly those serving the coalfields of Pennsylvania, Maryland, and Virginia, and the experience gained in the tests that have been made to date has been summarised by Mr. John Y. Yellott and Mr. Peter R. Broadley, respectively Director and Assistant Director of Research of the B.C.R. Locomotive Development Committee. The experimental installation has been at the Dunkirk, N.Y., plant of the American Locomotive Company.

Protecting Blades from Erosion

The first American experiments were made in 1950 at Milwaukee with an Allis-Chalmers gas turbine, and the chief obstacle to success was found to be erosion of the turbine blades due to inadequate separation of fly-ash. Tests in the same year of a Houdry gas turbine were more successful by reason of the use of a highly efficient multi-tube fly-ash separator, a larger version of which was then designed to suit the Allis-Chalmers plant. In a preliminary test of 178 hr. running, in the autumn of 1951, using a pilot oil-burner in each combustor, and with a maximum load restricted, over any considerable period of the test, to 2,000 h.p. (as compared with the rated turbine capacity of 3,750), it was shown that the separator was able to protect the turbine from blade erosion provided that all the individual separator tubes functioned properly.

It was then decided to conduct a much more severe test, during which the turbine would be run for prolonged periods with loads exceeding 3,000 h.p. and at temperatures above 1,200° F., and without the turbine being opened up for inspection until 750 hr. of running had been completed. It was also decided that no oil should be used for combustion during any part of the 750 hr. that the turbine was actually under test. The elimination of the oil pilot flame made it necessary to develop a new burner-combustor combination, but eventually one was evolved which operated without oil over the entire power range, and without blowing out at maximum loads or flashing back at low loads. A new type of pulverised coal pump was devised capable of supplying the maximum consumption of more than 4,400 lb. per hr. On February 4, 1952, the 750-hr. test was begun, and in the first two months the full rated output of 3,750 h.p. was reached nine times; on March 6 a maximum output of 4,250 h.p. was maintained for more than an hour. Many difficulties were experienced during this test, the

worst of them a leak, due to a cracked weld, which developed in the fly-ash separator 70 hr. after the beginning of the test. This permitted a considerable amount of coarse ash to pass into the turbine, and resulted in turbine erosion which progressively affected the remainder of the test.

The separator was found to be faulty in design in that the blow-down lines from the individual tubes were combined in two manifolds which were led out through two openings in the pressure shell of the separator, and from time to time these manifolds became plugged with ash, reducing the efficiency of the separator. After the first 70 hr., a periodic sampling procedure was instituted to show if excessive amounts of ash were accumulating at the turbine inlet. If the sampling showed that the separator was not working properly, coal firing was stopped and attempts were made to clear the blockage; if this could not be done satisfactorily, the unit was shut down, and the separator was cleaned out manually.

Fuel Consumption and Power Output

In all, the test was conducted over 188 periods, the longest of 24 hr. continuously, and the average of about 4 hr. The fuel used was a high volatile bituminous coal containing approximately 4.3 per cent moisture, 7.5 per cent ash, 39.4 per cent volatile matter, and 48.8 per cent fixed carbon. The effective heating value at 1,300° F., was 12,200 B.t.u. per lb. At an average firing rate of 2,840 lb. per hr. the total consumption of coal was 952 tons (of 2,240 lb.), and the total power output was 2,070,750 h.p.-hr. with an average load of 2,760 h.p. Fuel was being consumed at an average rate of 1.03 lb. per h.p.-hr., which gave an average overall thermal efficiency of 18.7 per cent; the best figures were obtained when the power output was about 3,000 h.p., and was an overall thermal efficiency slightly exceeding 20 per cent, for a consumption of 0.95 lb. per h.p.-hr. The turbine inlet temperature was always above 900° F.; it averaged 1,200° and reached a maximum of slightly over 1,300° F.

Other troubles of various kinds were experienced during the test. One was foreign matter in the coal, such as bolts, spikes, and so on, which caused several enforced shut-downs. Another was erosion of the lines leading from the separator to the disposal tank, but this, it was found, could be rectified without great difficulty. During the last 150 hr. of the test it was evident that the power output was below normal, and this was proved definitely when several runs were made at full capacity before the plant was dismantled for inspection. Extensive erosion was then found in the first five stages of the turbine, most evident in the portions of the blading adjacent

to the rotor, and undoubtedly due to the excessive amount of coarse ash that had passed through when the separator was not functioning properly. Only the final row of rotor blades was undamaged, showing that the ash had become completely pulverised before this stage.

It is evident from this test that efficient separator performance is a *sine qua non* if coal-fired gas turbine propulsion is to succeed in a locomotive, and this means, in effect, that there must be complete removal of all fly-ash particles larger than 20 microns, or roughly 0.001 in. dia. The two coal pumps stood up well to their work, and showed relatively little abrasion after 575 hr. continuous service; control of the rate of feed also was satisfactory. Ring-supported combustors came through the test in good condition after 140 hr. of oil-burning and 698 hr. of coal-burning, showing a combustion efficiency consistently above 95 per cent. A point of special interest was that a coal-burning power plant had been evolved for locomotive use which conformed to the most stringent smoke-control ordinances, showing only a grey haze at the top of the stack even in full load conditions.

IRON AND STEEL PRODUCTION.—Iron and steel production figures for June were affected by the Coronation holiday as well as normal holidays. Nevertheless the highest rate recorded for the month was achieved, with a weekly average of 337,700 tons. The previous highest output for the month was in June, 1952, when the average was 312,500 tons.

MOSCOW-PEKING DIRECT ROUTE PLANNED.—It is reported that a direct route is planned between Moscow and Peking to shorten the present circuitous route via Harbin and Mukden, and reduce the journey time throughout from about a fortnight to nine days. It has also been announced that it is now possible to travel without change of carriage from the Soviet Union to neighbouring countries of Eastern Europe, in spite of the difference of gauge.

B.S. FOR SEAMLESS, STEEL BUTT-WELDING PIPE FITTINGS.—A new British Standard (B.S. 1965:1953) relates to butt-welding fittings for general purposes. The range of fittings and the range of sizes of fittings covered have been chosen to meet existing demands, and fittings to suit classes "B" and "C" tube thicknesses to B.S. 1387 have been included. Dimensions and tolerances, materials and method of manufacture, heat treatment, tests, pressure and temperature ratings, and marking applicable to the fittings are specified. Copies of the standard may be obtained from the British Standards Institution, Sales Branch, 24 Victoria Street, London, S.W.1. Price 3s.

Chicago Swing Bridge Raised and Fixed

The work of raising a 228-ft. span was carried out with only 30-hr. complete closure to traffic



The 220-ft. span weighing 660 tons after being raised 6 ft., as shown by difference in levels of catenary portals

JUST south of 130th Street, Chicago, the Chicago, South Shore & South Bend electrified double line crosses the Calumet River. This line is the property of the Illinois Central company, but is leased to the South Shore in perpetuity. The Calumet is navigable, and the railway bridge over it consists of what has hitherto been a 228-ft. swing span, allowing two 90 ft. channels when open for navigation. Some 84 trains cross it daily and it has been necessary to swing the bridge about 5,000 times annually. Not only have operation and maintenance been costly, but a speed restric-

tion of 40 m.p.h. and a compulsory drop of the pantograph has been necessary for every train crossing the bridge.

The railway has therefore been endeavouring for some time to obtain Government sanction to substitute a fixed span for the movable span. The Corps of Engineers, which is responsible for bridges over navigable waterways governed by Federal regulations, eventually agreed to a fixed structure on condition that it had a clear headway for navigation equal to that of the lowest existing bridge elsewhere over this river. This entailed raising the whole superstructure and its approaches by 6 ft.

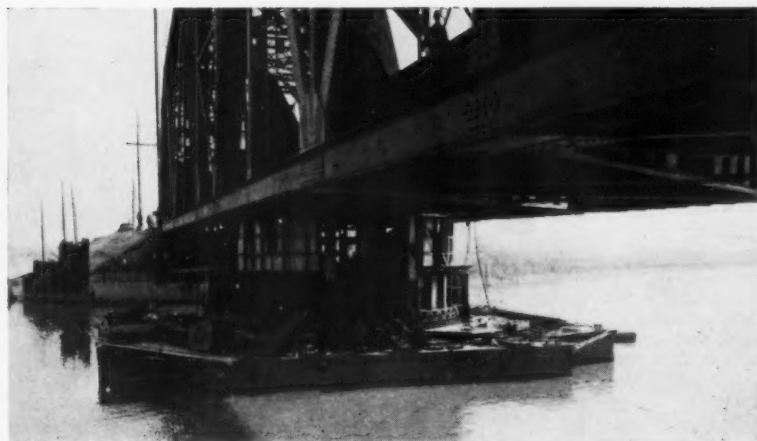
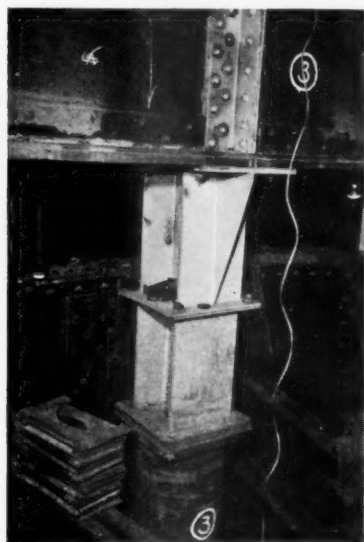
It was decided to risk bad weather and undertake the work during the first week in December last. On November 17, the eastbound track was closed and

single-line working over the westbound track was begun. An approach trestle viaduct ramped at 1 in 100 was then constructed on each side of the bridge on the eastbound alignment, to enable the track to be raised on stone pitching and ballast, of which some 10,000 cu. yd. in all were used.

At 8.30 a.m. on December 5 the bridge was closed, traffic being handled by bus services, and at 8.45 the raising of the bridge weighing 660 tons began. It was raised in three stages by four 500-ton jacks placed round the centre pivot on the pier. Just seven hours later, at 3.45 a.m., the lifting was completed, and by 8 a.m. river traffic was resumed. By 2.30 a.m. on the following day, December 7, the approaches, plate-laying, and electric connections were ready, and single-line traffic over the eastbound track was resumed. The central portion of the bridge span was also strengthened. At 11 p.m. on December 11 the westbound track also was similarly completed and double-line working was resumed. The bridge was therefore totally closed for 30 hr. only, and double-line traffic was interrupted for only 24 days.

The approach trestle work was done by Illinois Central labour, and the track, electrical, and signalling work was completed by 50 South Shore men; the bridge raising and strengthening was entrusted to the American Bridge Company. Estimated cost was \$100,000.

INAUGURATION OF FERRY BERTH AT ZEEBRUGGE.—Mr. L. H. K. Neil, whose name was given on page 24 of our July 3 issue as present at the inauguration on June 27 of the new berth at Zeebrugge for the Harwich-Zeebrugge wagon ferry service of the Société Belgo-Anglaise des Ferry-Boats, S.A., is Vice-Chairman of that company besides being Continental Traffic Manager, British Railways, Eastern and North Eastern Regions.



Left: 500-ton jack under two of the three steel packings used. Right: Steelwork erected on central pier to carry the raised span permanently

Access Ladder for Roof Inspection

Constructed for the L.M.R. for the examination of station roofs

A MOBILE inspection ladder has recently been constructed by Merryweather & Sons, Limited, in conjunction with the London Midland Region, British Railways. Designed primarily for the inspection of high station roofs, obviating the use of expensive scaffolding, the ladder fulfils a dual purpose, since it can also be operated from a station platform, and being mounted on a four-wheel underframe can be used as a mobile unit on the system.

Design Features

The inspection ladder is designed to rotate in any direction and to reach a height from the ground of 65 ft. The fulcrum frame which carries the ladder is mounted on a low steel frame carriage on four rubber-tyred castoring wheels. Four folding, screw-down

jacks are fitted so that when in position they give the ladder four-point stability and enable it to be operated within a wide range of angles of elevation in perfect safety.

The ladder itself is in three nesting sections (one main ladder and two moving sections) all of steel tubing of special section. The ladder, in general, follows closely the pattern of the Merryweather turntable ladder fire escape. Ladder rungs throughout are covered with renewable treads. All movements of the ladder are carried out by specially designed hand-operated gear. A double-purchase hand winch controls elevation and has an automatic over-run safety brake and pawl.

The winch is connected to the heel of the ladder by a wire rope system, and operation of the winch draws the heel of the ladder inwards until the desired

angle of elevation is reached. The ladder extension gear also has an automatic over-run brake, the ladders being controlled by pawls which also serve to register the rungs in line and to take the weight from the extension gear. The two moving sections of the ladder extend smoothly and in unison by the wire rope system.

The turntable frame is mounted on a roller-bearing path, and easily rotated through 360 deg. by a worm-gear operated by a handle. At the head of the top ladder is a small platform on which the inspector or technician can stand; a toeguard is provided as a safeguard while the ladder is being extended or lowered. An indicator plate shows clearly to the operator at the base of the ladder, by means of a pointer and quadrant, the maximum safe extensions at various angles of inclination.



L.M.R. 65-ft. turntable ladder mounted as a mobile unit



The inspection ladder in its fully extended position

HEAVY ADVANCE BOOKINGS TO CONTINENT. —Advance bookings to the Continent by British Railways cross-Channel services indicate that more people are going abroad this year than last. Car traffic is particularly heavy, and it is expected that holidaymakers will take more than 100,000 abroad this season. An increase of 30 per cent in special trains chartered by travel agents to Austria and Switzerland is expected, and similar traffic to the South of France may well show an increase of

50 per cent over last year. A special feature is the number of parties booking to Yugoslavia. Day trips from Folkestone to Boulogne show very heavy advanced bookings, particularly from schools.

ENGLISH ELECTRIC ORDINARY SHARES ISSUE. —It has been decided by the directors of the English Electric Co. Ltd. that further permanent capital is necessary to cover the rising output of normal products from the group of companies and their contribu-

tions to the defence programme. They have therefore arranged to provide approximately £6,568,000 by issue of ordinary shares and debenture stock. Applications are invited for £2,500,000 of 4½ per cent debenture stock, and 1,769,365 ordinary shares of £1 each are being offered to holders of ordinary stock. It is considered that in normal conditions of operation profits for 1953 should cover a final dividend on the increased capital at the same rate as in 1952.

Restoring British Permanent Way to Prewar Conditions

Large part played by mechanisation in relaying to standards for high-speed running



The East Coast main line at Little Bytham, an example of well-maintained permanent way

UP to the outbreak of war the permanent way of the main trunk lines of this country was in good condition, and the organisations of the companies responsible for its maintenance worked smoothly and efficiently. Speeds up to 90 m.p.h. were permitted and achieved on the regular daily main line services, but as the pressure of external demands imposed on the railways by the needs of war increased it became necessary to accept handicaps which resulted in a general lowering of standards of track conditions. As a consequence, the maximum speed on many trunk routes had to be limited to 60 m.p.h., and whilst these restrictions were gradually relieved where circumstances allowed at the end of the war, for the most part rehabilitation was hindered and made difficult by several adverse factors.

To maintain a railway which will allow a standard top speed of 90 m.p.h. demands an adequate labour force competently trained and working under a high order of undivided supervision and control. The needs of war meant that the railways had to suffer both an increasing loss of men to outside industry and increasing demands on the time of those who remained, for new works for war purposes, civil defence work, and similar special activities, with the inevitable consequences. Moreover, there were a number of key points on the railways at which work had to be concentrated, and where it was found most difficult to recruit and even to retain men. Track work had to be confined largely to the vital aspects of alignment and level, and the finer points of track maintenance, as well as such matters as the riddling and clean-

ing of ballast, proper care of drainage and formation, cuttings, and embankments, suffered considerable neglect.

Apart from the loss of men there was enemy action to contend with. Bomb damage inevitably meant sudden calls for all available hands, and thus the time available to the reduced labour force for normal maintenance work was cut down still more. In addition there were difficulties in the supply and quality of materials, and much improvisation became necessary.

Such were the conditions, but it was expected that as soon as the fighting was done the railways, in common with other industries, would be encouraged

and enabled to emerge quickly from this difficult situation. What happened was that the shortages and restrictions imposed by the war grew more acute and oppressive in years immediately after it. The labour force continued to dwindle, common sources of supply of almost all timber for sleepers had contracted, and the restrictions on the supply of steel were equally difficult, yet many passengers and consignors were unaware of, or failed to understand, the situation, and as the years passed increasing complaints of the inefficiency of the railways arose.

Staff Training and Mechanisation

Clearly, if the railways were to be kept going, means had to be found to circumvent such conditions. If a shortage of men had to be accepted, the men available had to be made more effective by better training in the technique of their duties, and by the increasing use of machines. A drive was therefore begun to increase and extend the prewar practice of training classes for permanent way staff throughout the winter evenings, and to hold special training courses for the higher ranks. Special educational films were made and now tour the country in cinema coaches; during the past 18 months, over 800 showings have been given to more than 38,000 members of the civil engineering staff.

In addition, the closest attention was given to all fields of mechanical development in this country and elsewhere to see what power-driven machines were available or could be adapted for track work on British Railways. The extent of the progress made in this direction will have been apparent



Weed killing demonstration at Lacock, Western Region, with a Bristol tractor and power sprayers

to all who saw the exhibition of plant in the goods yard at Marylebone in 1951, many exhibits in which were devised by British Railways, and followed the series of articles in our November 2, 9, 23, and 30, 1951, issues. Again, because of restrictions on capital expenditure, supplies could still come in only a trickle instead of a steady flow, and such matters as variations in structure gauges in different countries made much adaptation and modification necessary.

A need common to most Regions was to overcome many problems presented by clay soils in the formations and slopes of cuttings and embankments, apart from associated and separate drainage works of considerable size. Carrying out such works invariably requires extended periods of possession of the lines and special treatment, necessitating diversion of traffic; they also involve large-scale deployment of men, materials and plant. Heavy

carried out by hand over many miles, and altogether many thousands of tons of new ballast have been used.

Another machine brought into use consolidates the ballast under the sleepers by vibration tamping. This work, previously done by hand, ensures that a firm bed of ballast is made for each sleeper, and has the advantage over the hand-packing method that each sleeper is packed to the same consistency, ensuring an even 'top' to the rails, most important for high-speed running.

A new investigation had also to be made on many sections of main line into alignment and cant for curves in relation to the prevailing type and speed of traffic; standard rules and formulae have been evolved for this purpose. Their application in the first instance to the trunk routes has already resulted in smoother running and consequent easing or abolition of a number of



Matisa self-propelling automatic ballast tamping machine

annual programmes of such works have been successfully carried out since the war, and their execution has been essential to restore tracks to running conditions free from speed restrictions.

Apart from the special treatment of the formation, the condition of the ballast in general had deteriorated during the war because of unavoidable neglect, so that after the war a heavy programme of cleaning and renewal had to be undertaken. At many places existing ballast has had to be removed completely and replaced by new ballast. At others, the ballast has been cleaned and the deficiency made good. Here, the greatest possible use has been made of large on-track ballast cleaning machines which remove the ballast from under the sleepers, screen it, and return the clean ballast to the track, depositing the dirt either in wagons or at the line-side, as circumstances require. In addition, ballast cleaning has been

speed restrictions. The re-designing of some main line junctions has also allowed trains to pass over them at higher speeds than formerly.

Accelerating Track Renewal

The renewal of track by cranes and special tracklaying machines which lift out entire 60 ft. lengths of old track and lay in pre-assembled 60 ft. lengths of new, allows the process of renewal to proceed at a considerably faster rate than possible by older methods. The added attraction of this type of renewal is that it has eliminated possessions of the line for unloading and loading both the new and old materials, thus leaving the tracks clear for other important rehabilitation work.

The special track-laying machines referred to were originally devised for pre-fabricated relaying in tunnels, but from the engineering and operating viewpoint have proved so suitable for



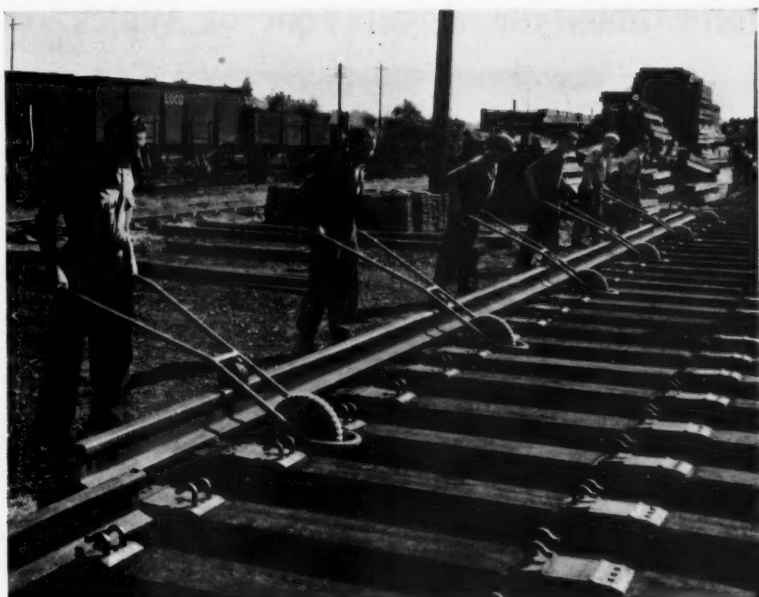
Taylor & Hubbard Limited diesel-electric cranes without rear overhang, laying prefabricated track

relaying that they are no longer confined to work in tunnels but are used at large to the greatest extent. Only within the last twelve months or so the labour situation has improved, and the supply of materials has shown welcome signs of becoming less restricted. It is also fair to say that by the pooling of ideas and engineering resources, the unification of the railways has afforded opportunities for more rapid progress than might otherwise have been possible.

While special emphasis can justifiably be laid on the work achieved by mechanical means, this must not detract



Machine digging lineside trench in connection with blanketing between Gidea Park and Harold Wood, Eastern Region



from the efforts made by the permanent way supervisors, length gangs, and other gangs in their efforts to restore the main lines a condition comparable with that before the war. The result is only now beginning to appear. On a few main lines it was possible to raise the overall speed limit to 85 m.p.h. by the end of 1948, but only recently has there been enough all-round improvement to justify, in some cases, the complete removal of the overall limit, and in others the raising of the figure of 85 m.p.h. to 90 m.p.h. for the summer services.

Although it cannot yet be claimed that the return to prewar standards and conditions is complete, in general, the amount which has been accomplished gives good reason to hope that it will be possible to complete the operation to everyone's satisfaction in the foreseeable future.

Laying flat-bottom track with Abtus rail barrows

Tube Bending Equipment

Hand- and power-operated machines for site work

TWO new types of Staffa tube bending machines have been recently designed by Chamberlain Industries Limited, which, because of their extreme mobility, can be used on site work as well as in the workshops. The benders are hand or power-operated, and both are self-contained units. One of the features of the design of this equipment is that it does not require fixing or foundation bolts.

The hand-operated type uses a two-stage hand hydraulic pump, having a bucket-type low pressure piston which accelerates the initial movement of the ram to the workpiece, and then by means of a quick-action dog brings

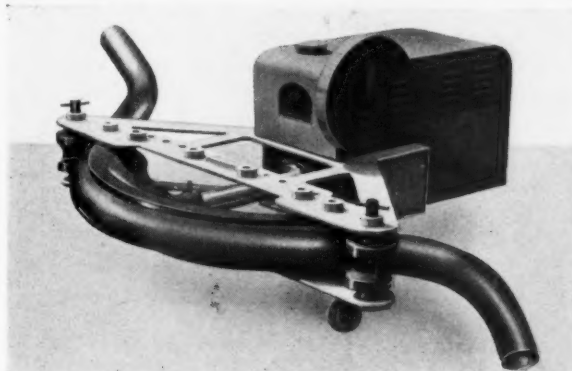
into operation a smaller diameter high-pressure piston, which carries out the actual bending of the tube.

Ease of Unloading

Features of these machines are ease of operation and a patent method of ejecting the tube automatically from the centre forming die after forming the bending operation. The machines are capable of bending steam and gas tubes of $\frac{1}{2}$ in. to 4 in. nominal bore, and cold and unloaded solid drawn and hydraulic steel tubes up to $3\frac{1}{2}$ in. outside dia by $\frac{1}{8}$ in. wall thickness. The motorised machine has similar capacities.

The firm has also included in its range of standard formers, bending dies suitable for handling 5-in. nominal bore steam and gas tubes of all classes. This means that dies are now available in standard form to bend on their various types of machines 2-in., $2\frac{1}{2}$ -in., 3-in., 4-in., 5-in., and 6-in. nominal bore tubes.

Modifications have been incorporated in the latest model of the 50-ton horizontal bender to provide greater ease in handling, and a hydraulic cut-out fitted integral with the oil system, limiting the stroke of the ram in its forward and return positions, is now included.



Staffa portable bender showing the forming die



Fifty-ton capacity Staffa tube bending machine

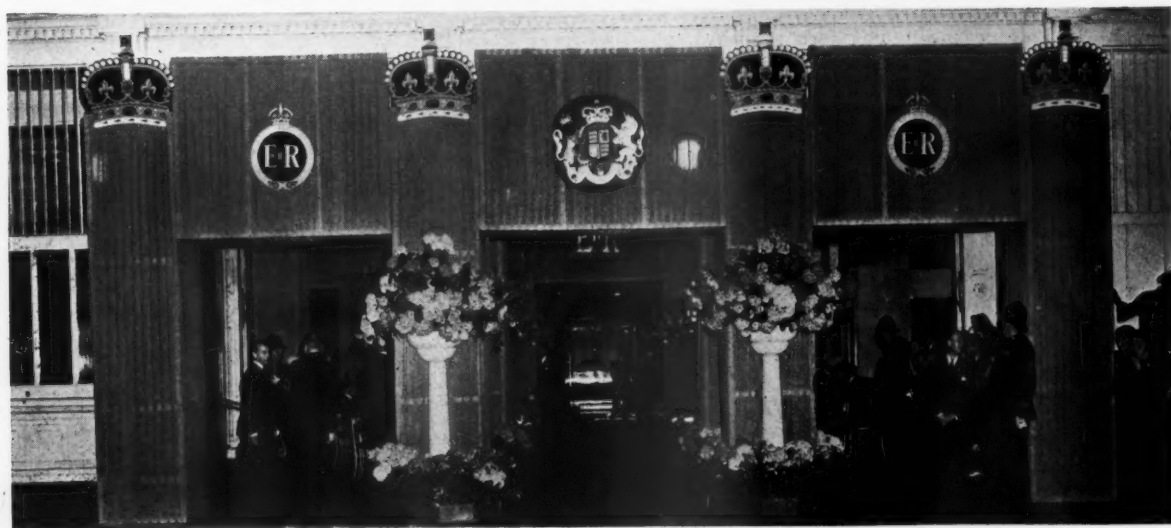
Western Region Decorations for Royal Tour of Wales



Decorated platform at Llangollen station



Part of the booking hall at Swansea decorated for the Royal visit



View looking through baggage hall towards No. 1 Platform at Paddington

RAILWAY NEWS SECTION

PERSONAL

Mr. T. A. Joseph, who, as recorded in our July 10 issue, took over as General Manager of the Southern Railway on May 15, was born in 1903, and educated in St. Joseph's College, Trichinopoly, and Presidency College, Madras. After taking the degree of Master of Arts in 1924, he entered the service of the North-Western Railway and was posted to Lahore as Pro-

and Hammersmith, and with Sir Robert Elliott-Cooper & Son, Consulting Engineers, Westminster. He joined the Inns of Court O.T.C. in June, 1918, and after the Armistice of the 1914-18 war served for three months in the King's Royal Rifles. He joined the South Indian Railway in October, 1923, as an Assistant Engineer, Maintenance, and continued in this capacity with intermittent periods in the Bridge Engineer's office, on tunnel survey on the

Kensington. He was Assistant to Mr. Leslie Robertson when the latter was appointed Secretary of the Engineering Standards Committee in 1901; and he was Electrical Assistant Secretary from 1902 until 1916, when he succeeded to the post of Secretary. In 1929 the British Engineering Standards Association (successor to the Engineering Standards Committee) again changed its name to the British Standards Institution, and Mr. Le Maistre



Mr. T. A. Joseph
Appointed General Manager,
Southern Railway, India



Mr. E. La V. Parisot
Controller of Stores, Southern Railway, India,
who is retiring

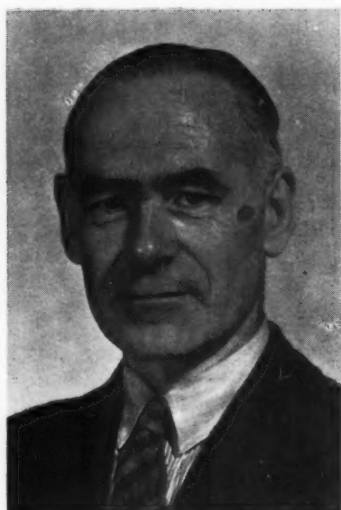
bationary Assistant Traffic Superintendent in 1927. In 1933, he was transferred to the Great Indian Peninsular Railway as Assistant Traffic Manager. He worked as Assistant Traffic Manager, District Traffic Manager, Divisional Superintendent and Deputy Chief Traffic Manager on that railway until he was transferred to the South Indian Railway in August, 1948, as Chief Traffic Manager. In June, 1951, he became Senior Deputy General Manager of the Southern Railway, which was formed by the integration of the Madras & Southern Mahratta, South Indian and Mysore State Railways, and worked in this capacity until he took over on May 15, 1953, from Mr. K. R. Ramanujam as General Manager.

Mr. E. La V. Parisot, E.D., A.M.I.C.E., Controller of Stores, Southern Railway, was born on June 5, 1900, and educated at the Oratory School, Edgbaston, Birmingham. He received his engineering training with Gwynnes Pumps Limited, Chiswick

West Coast, as Executive Engineer, Ferok, on the finishing stage of the Ferok Bridge, as Acting Deputy Engineer, Maintenance, and as Personal Assistant to the Chief Engineer. In September, 1938, Mr. Parisot was transferred to the Stores Department and appointed Deputy Controller of Stores, Golden Rock, and Controller of Stores, Negapatam, in June, 1946. He served in the South Indian Railway Auxiliary Force Battalion, India, from 1924 until it was disbanded. He also served in the South Indian Railway Military Stores Unit of the Indian Service of Engineers during the 1939-45 war. After returning from leave in 1951 he was appointed Controller of Stores of the Southern Railway in September, 1951. He is due to retire in July, 1953.

We regret to record the death on July 5, in his 80th year, of Mr. Charles Le Maistre, C.B.E. Mr. Le Maistre was born in Jersey in 1874, and educated in Brighton and at the Central Technical College, South

became the B.S.I.'s first Director. He relinquished this office in 1942, and was appointed Chairman of the Executive Committee until his final retirement from the B.S.I. in 1943. He then played a prominent part in the formation of the United Nations Standards Co-ordinating Committee, and served as Secretary of that body until its dissolution in 1946 to make way for the International Organisation for Standardisation. Mr. Le Maistre's interest in international affairs dated from 1904, when he was appointed General Secretary of the newly-formed International Electro-technical Commission, a post which he held until his death nearly 50 years later. Although his early training was in electrical engineering, his association with the British Standards Institution brought him into touch with many branches of industry, and for his services in connection with standardisation during the 1914-1918 war he was awarded the C.B.E. He served on the British delegations at several Commonwealth Conferences when matters



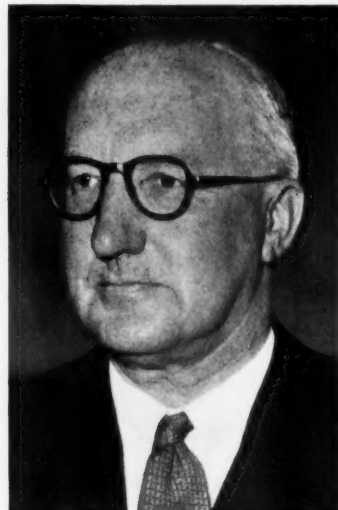
Mr. C. E. Dunton

Appointed Chief Civil Engineer,
London Transport Executive



Mr. T. S. Pick

Appointed Chief Electrical Engineer,
London Transport Executive



Mr. H. Eccles, J.P.

District Goods Superintendent, London,
London Midland Region

affecting standardisation were discussed. He was a member of the American Institute of Electrical Engineers as well as a Corporate Member of our own Institution of Electrical Engineers, and among the foreign honours conferred upon him were the Knight Commander (Second degree) of the Royal Swedish Order of Vasa, and Honorary Membership of the Royal Dutch Institution of Engineers. Mr. Le Maistre's international activities also covered the field of documentation, and he was President of the International Federation for Documentation from 1946-1951. He was also for many years a member of the Council of A.S.L.I.B. (notably during the period of its amalgamation with B.S.I.B.), and was Chairman in 1949-50.

Mr. C. E. Dunton, M.A.(Cantab.), M.I.C.E., Chief Engineer, London Transport Executive, who, as recorded in

our June 26 issue, has been appointed Chief Civil Engineer, is 54. He was educated at Haberdashers' School, the Royal Military Academy, and Christ's College, Cambridge, where he obtained the degree of Master of Arts with second-class honours in mathematics and mechanical sciences. He entered the service of the Underground Group of Companies in 1923, and served, successively, as Technical Assistant in the Architectural, New Works, Bridge, Permanent Way (Railways) and Works & Building Sections of the Civil Engineering Department. In 1939 he was appointed Permanent Way Engineer (Railways), and was a member of the London Passenger Transport Board's Post-War Planning Committee. He was appointed Civil Engineer (Development) in 1947, Technical Planning Officer a year later and Civil Engineer in 1951.

Mr. T. S. Pick, B.Sc.(Eng.), M.I.E.E., M.Inst.F., Electrical Engineer, London Transport Executive, who, as recorded in our June 26 issue, has been appointed Chief Electrical Engineer, is 57. He was educated at St. Peter's School, York, the Royal Military Academy and University College, London, where he obtained his B.Sc. degree and Diploma in Engineering. He joined the service of the London Electric Railway Company in 1923, and during the whole of his service has been associated with the electrical department of the Underground Group and London Transport. He was appointed Technical Investigation Officer (Electrical) in 1939. He was appointed Substation Engineer in 1945 and Electrical Engineer in 1948.

Mr. Herbert Eccles, J.P., District Goods Superintendent, London, British Railways, London Midland Region, who, as recorded



Mr. N. N. Kakati

Regional Mechanical Engineer (Pandu),
N.E. Railway, India, who has retired



Mr. L. Rowland

Indoor Assistant to Operating Superintendent,
London Midland Region, 1942-53



Mr. R. P. Crutchley

District Motive Power Superintendent,
Glasgow (South), 1949-53

in our June 26 issue, retired on June 30, began his railway career as a clerk at Newton-le-Willows in 1907. He became Assistant District Goods Manager at Warrington in 1941 and at Liverpool in 1944, and a year later went to Stoke as District Goods & Passenger Manager. His post in London, which he took up in October, 1949, was one of the most important commercial positions on the railway. He was responsible for the handling of over a quarter of a million tons of goods a month, the forwarding of over 10 million consignments a year to all parts of the country and the delivery of the larger part of London's meat, coal and vegetable supplies. He controlled 1,500 road vehicles for collection and delivery of goods. Mr. Eccles is a member of the Committee of the Metropolitan Section of the Institute of Transport, and a member of the Transport Committee of the London Chamber of Commerce. He is also the Chairman of the Rails Executive Committee of the British Transport Officers' Guild, as well as being a Freeman of the City of London.

Mr. Narendra Nath Kakati, B.Sc., A.M.I.E., A.M.I.E., Regional Mechanical Engineer (Pandu), North Eastern Railway, India, who, as recorded in our June 26 issue, has retired, closed a railway career of nearly 30 years service on June 11. On receiving the degree of B.Sc. from Calcutta University, he proceeded to England for further studies and obtained the B.Sc. degree in mechanical engineering from Bristol University. He was then a pupil with the Great Eastern Railway for three years in their workshops at Stratford. He joined the Bengal-Nagpur Railway in India in December, 1924, as a Probationary Assistant Locomotive Superintendent. After working in various capacities, he was promoted to the rank of Deputy Chief Mechanical Engineer (Junior Administrative) in Kharipur in 1945. He was transferred to the Assam Railway as Head of the Mechanical Department in July, 1948. After the regrouping of the Indian Railways on April 14, 1953, he was appointed as Regional Mechanical Engineer of the Pandu Region. On attaining the age of 55, he has retired.

Mr. L. Rowland, Indoor Assistant to the Operating Superintendent, London Midland Region, British Railways, who has retired after 45 years railway service, was born at Derby and entered the service of the Midland Railway as a junior clerk in the Personal Office of the Chief Civil Engineer in June, 1908. He served in the 1914-18 war with the 2nd City of Birmingham Battalion of the Royal Warwickshire Regiment and was seriously wounded in the 1916 offensive at Guillemont on the Somme. Mr. Rowland returned to the Chief Civil Engineer's office in 1918 and, in July 1923, transferred to the Chief General Superintendent's Office to deal with Joint Line matters, subsequently being engaged on Parliamentary and Committee work in the New Works Office. In 1932 he moved to Euston to deal with Pooling and Closer Working matters and for a period of two years was loaned to the Chief Accountant in connection with financial settlement questions arising out of the inter-company schemes. Mr. Rowland became Indoor Assistant to the Operating Superintendent in 1942 and has been associated with four Operating Superintendents, one of whom, Mr. J. W. Watkins, is the present Chief Regional Officer of the London Midland Region. For 19 years before leaving Derby, he was Honorary Secretary of the Derbyshire Lawn Tennis Association

and was elected a life member. He is a member of the Partington & Abbots Langley Lodges of Freemasons.

Mr. R. P. Critchley, District Motive Power Superintendent, Glasgow (South), Scottish Region, British Railways, whose death was recorded in our July 10 issue, was educated at Grosvenor College, Carlisle, and entered the service of the former North British Railway in the Locomotive Department at Carlisle in 1914. Four years later he was transferred to Cowlaers Works, Glasgow, and completed his technical training under the late Mr. W. P. Reid, then Locomotive Carriage & Wagon Superintendent, North British Railway. Returning to the Locomotive Running Department at St. Margaret's, Edinburgh, in 1920, Mr. Critchley was appointed Locomotive Shed Foreman, Ladybank, in 1921, and subsequently held similar appointments at Fort William and Perth. Following a period as Technical Inspector, Locomotive Running Superintendent's Office, Glasgow, Mr. Critchley was, in 1933, appointed Locomotive Shed Foreman, Aberdeen, and in this capacity had charge of all Locomotive Depots in the Great North of Scotland section of the L.N.E.R. and also of Ferryhill, the former North British Railway Depot, at Aberdeen. In 1939 Mr. Critchley was appointed District Locomotive Superintendent, Burntisland, and three years later he became District Locomotive Superintendent, Edinburgh. Moving to Glasgow as District Locomotive Superintendent in 1943, he became District Motive Power Superintendent of the newly-formed Glasgow (South) District of British Railways on January 1, 1949. A Member of the Institution of Locomotive Engineers, Mr. Critchley was Chairman of the Scottish Centre 1948-49 and 1949-50.

Mr. A. C. Edrich, A.M.I.C.E., Permanent Way Engineer (Railways), London Transport Executive, who, as recorded in our June 26 issue, has been appointed Assistant Civil Engineer (Permanent Way), is 42. He entered the service of the Metropolitan District Railway in 1930 as an apprentice, and in 1934 he became an engineering cadet, rising by 1938 to Liaison Assistant for Engineering Works on the Bakerloo Line in connection with the 1935/40 New Works Programme. In 1944 he became Senior Assistant to the Permanent Way Engineer (Railways) and was appointed Permanent Way Engineer (Railways) in 1951.

Mr. H. Leach, Assistant (Road and Air Transport) to the Chief Commercial Manager at Euston, British Railways, London Midland Region, has been appointed Assistant (Outdoor) to Commercial Superintendent, London Midland Region.

Mr. S. Kelsey, Locomotive Shed Master, Doncaster, has been appointed Assistant District Motive Power Superintendent, Doncaster, Eastern Region, British Railways, in succession to Mr. D. C. Stuart, who has retired.

We regret to record the death, at the age of 83, of Colonel G. T. Glover, Locomotive Engineer with the Great Northern Railway (Ireland), 1912-33.

Mr. Roy E. Barr, for eleven years Vice-President in charge of traffic of the Illinois Central Railroad, is retiring on August 1, after which date he will serve the Illinois Central as Consultant. He will be succeeded by Mr. Robert A. Trovillion.

Mr. G. H. Waumsley, who recently relinquished his post as Inspector-General of Traffic & Acting Traffic Manager, Iraqi State Railways, has joined Trans-European & Eastern Transport Ltd., 14-15, Queenhithe, London, E.C.4, general freight and canvassing agents in Europe for the Iraqi State Railways.

Mr. R. B. Morris, A.M.Inst. T., Acting District Traffic Superintendent, Dodoma District, East African Railways & Harbours, has been appointed District Traffic Superintendent.

Mr. G. S. Ramage, Secretary of the Harland Engineering Co. Ltd., has been appointed a Director.

We regret to record the death, at the age of 58, of Mr. Horace S. Ecob, Yorkshire District Manager of Dean & Dawson Limited.

Mr. Leonard Olney has succeeded Mr. Duncan Haws as London District Manager of Dean & Dawson Limited.

Mr. K. S. Peacock, Deputy Chairman of Guest, Keen & Nettlefolds, Limited, has been elected Chairman, in succession to Mr. J. H. Jolly, who is retiring. Mr. Jolly will continue to serve the company as a Director.

Major-General Sir Richard Lewis, K.C.M.G., C.B., C.B.E., Mr. Edgar W. Percival, and Mr. A. Wood, Managing Director of C. E. Johansson, Limited, have joined the board of Henry Meadows, Limited. Mr. F. H. Harris and Mr. E. H. L. Cooper have been appointed Joint General Managers of the Company.

We regret to record the death on July 12, at the age of 64, of Mr. Charles Pinkham, Manager of the Publicity Organisation, General Electric Co. Ltd., 1927-50. For the last 14 years of his active service Mr. Pinkham was a member of the Council of the Advertising Association and the B.E.A.M.A. Publicity Committee.

THE INSTITUTE OF TRANSPORT

The following Officers and Members of Committee of the Metropolitan Section have been elected for the year 1953-54:—

Chairman: Mr. G. H. Searle (Ministry of Food).

Immediate Past Chairman: Mr. F. Gilbert (British Transport Commission).

Vice-Chairmen: Messrs. W. C. Collins (British Transport Commission), C. F. Klapper (*Modern Transport*), Alex. J. Webb (London Transport Executive).

Hon. Treasurer: Mr. A. R. Parselle (Ministry of Food).

Hon. Secretary: Mr. C. F. King (Bryant & May, Ltd.).

Committee: Messrs. A. C. B. Pickford (Railway Executive), S. E. Parkhouse (Railway Executive), S. G. Hearn (British Railways, London Midland Region), M. Brown (S.P.D. Limited), F. J. Speight (George Ewer & Co. Ltd.), A. Watson (Chamber of Shipping), D. O. Bustard (B.O.A.C.), E. G. Whitaker (Lever Bros., Ltd.), L. G. Burleigh (I.C.I. Limited), W. A. Flere (Port of London Authority), J. T. Evans (Docks & Inland Waterways Executive), D. Robertson (British Transport Commission), G. F. Stedman (Ministry of Transport), S. Hattan (Schweppes, Limited), R. E. Sinfield (British Railways, Southern Region), D. H. Foulds (Road Haulage Executive), W. R. Robertson (London Transport Executive), H. Eccles (British Railways, London Midland Region).

Ministry of Transport Accident Report

*Harrow & Wealdstone, October 8, 1952:
British Railways, London Midland Region*

L T.-COLONEL G. R. S. WILSON, Chief Inspecting Officer of Railways, Ministry of Transport, inquired into the accident which occurred at about 8.19 a.m. on October 8, 1952, at Harrow & Wealdstone station when the 8.15 p.m. sleeping car express Perth to London, Euston, consisting of 11 bogie vehicles of which 4 were sleepers, drawn by Class "8P" 4-6-2-type engine No. 46242, overran distant, outer, and inner home signals, and collided at between 50 and 60 m.p.h. with the 7.31 a.m. local train from Tring consisting of 9 non-corridor bogie coaches drawn by a class "4MT" 2-6-4 tank engine which had been crossed from the up slow to the up fast line.

Immediately after that the 8 a.m. express, Euston to Liverpool and Manchester, consisting of 15 bogie vehicles, drawn by two engines, class "6P" 4-6-0 No. 45637 leading and class "8P" 4-6-2 No. 46202 attached to the train, travelling at not much less than 60 m.p.h. ran into the wreckage, striking the derailed engine of the train from Perth. Its engines were diverted violently across a platform and overturned close to the No. 2 signal box controlling the traffic on the adjacent electric lines where current became cut off.

The damage was altogether exceptional and the heavy shock stopped the station clocks. Three coaches of the local train, three in the Perth train and seven in the Liverpool train, with two bogie vans and a kitchen car, were demolished or very heavily damaged. Thirteen of these 16 vehicles were compressed into a heap about 45 yd. long by 18 wide and 30 ft. high, completely burying the engine of the up express, foul of the down fast line. One end of the wreckage was jammed under the footbridge, a girder of which was torn away.

The list of casualties was inevitably very great; 98 passengers were killed and 10 fatally injured, 4 railway servants on duty were killed, including the driver and fireman of the over-running train and the driver on the leading engine of the down express. There was evidence that 64 passenger fatalities occurred in the local train, 23 in the up express, and 7 in the down. The remaining 14 were not located but probably some passengers waiting on the platform were caught by the engines. In addition 157 persons were conveyed to hospital where 84 passengers were detained, as were 4 railway servants on duty, including the fireman of the leading engine of the down train and both enginemen of its train engine.

The accompanying diagram shows the lines, signals and other details essential to an understanding of the case.

The View of the Signals

Before and after starting his inquiry Colonel Wilson made footplate trips to observe the signals concerned, travelling on an engine of the type that had hauled the up express. He paid particular attention to the view of the distant signals and possibility of confusion with the succession of colour-lights on the up electric line to the right. Generally the view of the signals was entirely satisfactory in clear weather.

The focussing of the distant colour-lights was good, having regard to the curvature. The home signals were as conspicuous as

possible with semaphores. A certain degree of care was necessary to avoid distraction by the electric line signals at one point, but no more than is required at many other places where the driver has to depend on his skill and knowledge of the road to locate his own signals.

Block Telegraph Regulations

The following regulations apply at Harrow No. 1 Box:—

(a) *In clear weather* the signalman is permitted to accept a train from Hatch End on the up fast line up to his outer home signal at danger, at the same time as a movement is signalled over the cross-over from up slow to up fast ahead of the inner home.

(b) *In fog* he is allowed the same freedom provided that a fogsignalman is stationed at the outer home, since the colour-light distant is regarded as the equivalent under these conditions of a semaphore distant with a fogsignalman stationed at it (Regulation 4(i)).

(c) If, however, in fog there is no fogsignalman at the outer home, acceptance of a train on the up fast line from Hatch End requires that the line should be clear for at least 440 yd. beyond the inner home, which presupposes that the cross-over is set in its normal position for straight through running on the up fast and slow lines.

Fog working must be put in force when the "fog object" can no longer be seen or, in default of one, when the signalman cannot see further than 200 yd. He then selects his own mark, and at Harrow the up slow homes were generally used, 303 yd. from the centre of the box. The 200 yd. limit thus was being interpreted liberally. The signalman had put fog working into operation at 6.35 a.m. when his view of these signals became obscured, but resumed normal working at 8.10, 9 min. before the accident, when they were once more visible. At the signal boxes on each side no fog working had been thought necessary, but at Bushey, where the up distants were at that date still semaphores, it was in force from 7.15 a.m. until the fogman arrived, but no check to up trains resulted.

Train Working

The previous express on the up fast line was the 10.20 p.m. from Glasgow which had met fog from Wigan onwards and passed Harrow at 8.11 a.m., 93 min. late. "Out of section" for it was received at 8.14. The local train, which left Tring punctually, was booked to cross up slow to fast at Harrow and run non-stop thence. Every endeavour is made to keep these residential trains to time and, except in emergency, signalmen are not expected to vary the routing laid down, such trains being given precedence over late-running expresses. The Harrow signalman received acceptance for the local train on the fast line at 8.14 but waited to clear his signals until it reached track circuit 2787 (see plan) although not called on to do that by rule. The home was, however, clear when the driver first saw it, owing to prevailing visibility, but he had slowed down to take the crossing. He stopped in the station at 8.17 and had been there at least a minute when the collision occurred.

The express from Perth had left Crewe at 4.37, 32 min. late. Although losing time it gradually overtook the other from Glasgow, which had passed it at Crewe, and was stopped by signal at Watford Tunnel, north end, but recovered speed and passed Hatch End as the local train was stopping at Harrow. The down Liverpool express left Euston 5 min. late owing to a vacuum defect, and was regaining time as it approached Harrow under clear signals. The second collision was quite inevitable.

Evidence of Signalmen

The signalman at Harrow, No. 1 box, had been a signalman since 1938, with interruption by voluntary army service. He was appointed to Berkhamsted (Bourne End) at the end of 1947 and to relief grade, Class 1, Watford Area, in February, 1950. In August, 1951, he was passed to work Harrow No. 1.

He explained how he instituted fog working and removed it later when he could see not only the up slow homes but "some distance" beyond. He reversed the cross-over for the local train, and accepted the express from Perth about that time, receiving "entering section" for it as the local arrived. A minute or so later he heard it approaching at speed, "coming out of the mist," and passing his outer home. It was making no attempt to stop. He placed detonators and threw back his down fast signals, for he had received "entering section" for that line. He thought the train was under steam, "and its speed far in excess" of that of the previous express. He was unaware of any brake application and saw nothing of the enginemen. At no time had he any intention of varying the booked routing. Had he cleared his fast line signals and changed his mind he would have had to replace them, and the block controls would have obliged him to ask North Wembley for another "line clear."

The signalman there said he received "Is line clear?" for the local train at 8.14. No other was offered on the up fast after the Glasgow express. He received no cancelling signal. Colonel Wilson is quite satisfied that none was sent. Tests made in his presence to ascertain how much time would be needed to effect such a change of route proved that the colour-light distant could not have been returned from green to yellow less than 160 sec. before the collision and with the Perth train travelling at only 50 m.p.h. it would then have been at least 1,800 yd. in rear of it, a long way outside its range of view.

Evidence of Trainmen

The driver of the Glasgow express, a man with long experience of this line, said he had clear weather to Wigan; after that fog was practically continuous. The run was one of his worst for some time, with visibility restricted to 50 yd. most of the way, but he had no real difficulty in observing signals of any type, though he had been compelled to reduce speed from time to time from his general level of 55 to 60 m.p.h. He was coasting with a breath of steam approaching Harrow and had a clear view of the distant at green at 50 yd. or perhaps a little more than two engine lengths. The fireman confirmed this evidence.

The driver of the local train had a thorough knowledge of the lines in the outer suburban area. He described the fog generally as patchy. The Harrow distant was against him, being always "on" for his train. He saw it with no difficulty at about 50 yd. and used the fast line outer home as a location mark. There it was hazy rather than foggy, a great deal clearer than at the distant. His home signal was "off" when it came into view at, he thought, 150 to 200 yd. He had released his brakes and been in the station about two minutes when his train was struck.

The guard did not see the distants but on slowing down could see the engine, 140 yd. from him. He was in the last coach but two. When he heard, and then saw, the other train coming he took refuge under the far platform coping. He went to the box and was assured all lines were protected.

The guard of the up express said the driver remarked on the fog at Crewe; he seemed in good health, displayed no anxiety, and said he would do his best in the circumstances. They lost more time and encountered several signal checks, including the stop at Watford Tunnel. Through the station visibility was a great deal clearer; he could see to one of the leading vans, 180 to 200 yd. The train was "getting into the swing again" when there was a severe brake application and the van gauge went to zero. He was not injured, went to the signalbox and learned that the lines were protected. He did not think visibility bad enough to have fogmen out between Watford and Harrow.

The driver of a freight train on the down slow between Harrow and Hatch End said he was stopped in Harrow station. Looking back after leaving he could see about 200 yd. It was hard to say whether fogmen ought to have been out. The fog was drifting. He passed the Perth train somewhere north of Headstone Lane Station. It was noticeably thicker there, as often by open fields. His fireman remembered passing it and thought it travelling normally. The guard noticed the fast line inner and outer homes were "on" and that the Perth train was not braking, but it had ample distance to the outer home. He was "pretty certain" he had seen the up fast distant "on."

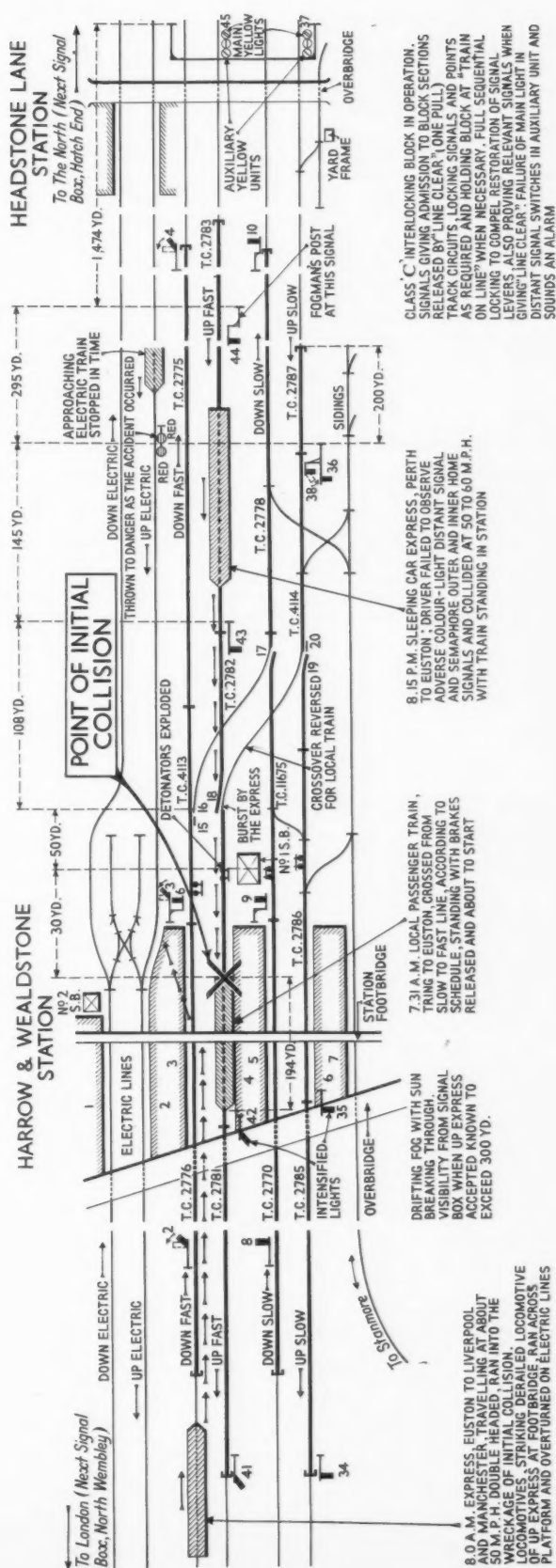
The surviving engine man of the down express gave evidence which, as far as it went, confirmed that of the others. None remembered seeing any obstruction or the down signals being thrown to danger. They thought their speed was not up to 60 m.p.h. Their guard put it at over 50.

Colonel Wilson heard a large amount of evidence regarding the condition of the engine of the Perth train and its crew, both killed. The driver was 43 and was appointed driver in January, 1948. On the day of the accident he booked on at 2.45 a.m. and was instructed to work the Perth train forward in place of the regular driver. The engine had been prepared by another crew and he had plenty of time to read notices, oil round, etc.

The running shed foreman was entirely satisfied with this man's work; he was steady, even tempered, and a good driver. He appeared perfectly normal that morning.

The post-mortem disclosed nothing to suggest he was not perfectly healthy. He was not suffering from the effects of diabetes, alcoholism or carbon monoxide poisoning.

The fireman had booked on with him. He was 23 and appointed fireman in 1945. He had worked fairly regularly on London trains since 1949 and had fired expresses



21 times in 1951 and 13 in 1952, one 5 weeks before the accident. He also was well spoken of.

Nothing could be found wrong with the engine to contrioute to the accident. The regulator was found closed and the reversing screw in forward gear at 60 per cent cut off, the normal coasting or drifting position. The blower was open by one turn of the screw valve and the driver's hand on the vacuum brake handle, fully applied. All the evidence suggested that he made no attempt to stop until the very last.

Colonel Wilson heard evidence from 17 other witnesses. The condition of the signalling apparatus was found to be sound in every respect. It emerged that no case was known to the Signal & Telecommunications Engineer or any of his staff of a false green indication appearing in a colour-light distant signal, except in the course of actual installation work, since their introduction in 1936; neither had any report of one being received by the Operating or Motive Power Departments.

Chief Inspecting Officer's Conclusions

Colonel Wilson is entirely satisfied that the first collision resulted from the Perth train over-running all signals. He is also satisfied that no responsibility should rest with the signalman. Once the first collision had occurred no one could have prevented the second. He is convinced too that the distant signal was correctly exhibiting a yellow light.

Reviewing at length the question of whether the Perth train should have been accepted, he points out that the signalman was expected to accord the residential trains the prescribed precedence. The block regulations authorised him to accept the express provided visibility in the neighbourhood of the box sufficed. (That at the distant signal was not relevant. No doubt conditions were better towards Harrow than at that signal.)

The signalman's statement that he could see the up slow homes at 8.10 is not thought inconsistent with the estimates of others, and the fact that he had instituted fog working earlier suggests that he was fully conscious of his obligations. Colonel Wilson considers that "he should be exonerated from all responsibility for the accident."

It is only possible to speculate on the circumstances of the human failure that brought it about. The driver had been proved alert by the signal stop at Watford and a gesture he made to a fog signalman at Bushey.

Temporary incapacitation by sudden illness seems unlikely, from medical report, and no distracting engine defect came to light. Colonel Wilson can only suggest that he relaxed his concentration, perhaps for quite some trivial reason, for a few seconds and having missed the distant may have continued on, underestimating his distance from Hatch End, still expecting to see it and not the semaphores at considerably higher elevation.

The fireman had no special reason to concern himself with the signals after the Bushey distant; there was a better view from the other side, and it is unlikely that an electric line signal could have been misread for the distant, from which the driver's experience and knowledge should have protected him. Neither is it probable that he became dazzled by the low sun there though it may have affected the background of the semaphores later.

Regulations and ATC Equipment

It being "fundamental" that safety "must depend at all times on the obedi-

ence to signals" the report finds no reason for criticising existing rules and regulations and emphasises that "the way to guard against exceptional cases of human failure such as occurred at Harrow does not lie in making regulations more restrictive . . . but in reinforcing the vigilance of drivers" by positive link between signals and footplate.

Of the 640 formal inquiries into train accidents in 41 years (1912-1952), 66—rather more than 10 per cent—might have been prevented or mitigated by warning A.T.C. This would have saved 28 per cent of the total fatalities or 399, including Harrow. This is because failure to act on a distant signal may lead to a high speed collision or derailment. Even had more elaborate apparatus been in use, such as continuous cab-signals, the likely saving in fatalities would only have risen to 36 per cent. "That, in short," says Colonel Wilson, "is the case for warning control."

He reviews the development of the question from the 1922 and 1927 committees. The reaction to the report of the latter was that, except for the G.W.R., the railways did not consider that A.T.C. was justified on account of its very great expense and the small number of accidents it would prevent, and that money would be better spent in other directions, although the exploration of the question was desirable.

The serious Bourne End accident of 1945 again brought the subject into prominence. The report on it contained strong recommendations and the railways were asked for their proposals. They replied that apart from finance, the general installation of A.T.C. would occupy considerable time and employ a large number of skilled men, in strictly limited supply. That would delay the execution of other modernisation work.

The British Transport Commission assumed control on January 1, 1948. In the meantime the Goswick accident had occurred. Sir Alan Mount, then Chief Inspecting Officer, reported that there were "substantial grounds" for extending A.T.C. equipment. Of the two systems then in use the G.W.R. type was by far the most extensive, on 1,356 route miles, the Hudd magnetic system, without fixed contact, being in service on 37.

After some small-scale comparative trials with these arrangements and discussion with the Inspecting Officers, the Executive put forward tentative proposals for a £6,000,000 6-year programme, on one or other system, although all technical problems were not fully solved. A programme of the same order for track circuiting and block controls also was recommended and these measures were accented by the Commission (Report for 1948).

The Executive at first inclined to the G.W. system but tests showed risk of false indications from stray currents on electrified lines and there was insufficient clearance between the ramp and motor cases of electric trains. These were felt to be important objections, while it was considered unwise to standardise a system in which heavy mechanical parts came in contact when more modern methods were available. A lesser objection was interference with snow ploughs in the North and difficulties of adaptation to certain cab layouts.

It was proposed therefore in 1948 to develop apparatus to combine the best features of the two systems, subject to large-scale trials proving its reliability, for which at least 12 months was suggested,

the G.W.R. system, however, not to be discarded without thorough investigation of means to protect the ramp against false energisation. Finally, a compromise system was decided on, the tests justifying a large-scale trial between New Barnet and Huntingdon, 65 locomotives to be equipped. Track magnets supplied for Edinburgh-Glasgow, with adapted engine receivers were made available, and Western Region cab units sent to contractors for relays, etc., to be fitted, but considerable delay followed. After the first few engines came into service it was found that the apparatus could not give sufficient braking force with Eastern Region brake equipment, while there was difficulty in locating the apparatus in the cabs where it could be best protected against dust and dirt.

Trials were not in full swing until December, 1950. They continued during 1951. Altering the original receiver to act electrically instead of pneumatically introduced problems, and certain safety side failures proved difficult to trace. In April, 1951, a small committee was appointed to investigate matters thoroughly and more systematically. Special testing apparatus was devised and proved very valuable; gradually improvements were effected. In August, 1952, what was hoped to be the final prototype design was complete. The first set made to it was in operation nine days after the Harrow accident, and by March, 1953, 54 engines had been fitted.

The Inspecting Officers thoroughly examined the working from the footplate and found it satisfactory. A stop against steam was made in a safe distance from 93 m.p.h. There is a bell signal for "clear" and a siren for "caution," with brake application and, as in the L.M.S.R. arrangements, when the driver cancels that a visual reminder indicator appears and remains until the next track location is reached. The warning is given on approaching an adverse distant, or a multi-aspect signal showing anything except green. The technical principles appear satisfactory but very full day-to-day tests will be required before the Executive can be satisfied with everything beyond all doubt; it is considered that a full normal 6 months service is needed, as from April, 1953. Colonel Wilson, however, thinks the period may have to be longer and thereafter further trials and laboratory tests to destruction under severe vibration may be necessary.

The Commission informed the Minister of Transport that, on hearing that he is completely satisfied on every point, it will be prepared to consider financial authority for the following:—

1. A 5-year plan estimated to cost £7,500,000;

2. A long-term plan including (1), estimated to cost £17,300,000.

(Corresponding annual maintenance charges, £1,000,000 and £2,200,000.)

Plan 1 would cover 1,332 route-miles "or such parts as might be deemed advisable," covering Euston-Glasgow-Birmingham - Manchester - Liverpool; Kings Cross - Edinburgh - Glasgow; Liverpool Street-Norwich; Waterloo-Exeter-Southampton-Bournemouth.

Dissipation of resources over too many routes is to be avoided and the plan probably would concentrate first on the main East and West Coast routes. The long term plan would cover an additional 3,988 route-miles, bringing the total to 5,320. Including existing equipment this would give a grand total of 6,713, 35 per cent of British Railways total of 19,276 and would

cover practically all main lines carrying heavy passenger traffic. (The existing proportion in the Western Region is very similar.) It would be wrong, however, for pressure to be exerted on either the Commission or Executive to embark on a very costly programme *before* trials are completed to the satisfaction of all concerned.

The Commission has, however, emphasised that A.T.C. cannot be given absolute priority over other forms of signalling modernisation in which progress has been continuous of recent years, designed to prevent accidents, numerous in proportion to the total, against which A.T.C. is no safeguard.

The carrying out of the programme, in relation to other work, must be left to the management's judgment, but Colonel Wilson regards A.T.C. not as competitive to other signalling development but complementary to it, as indeed was the Executive's view in 1948. He stresses that in contrast to the many effective devices developed and widely installed over the years to assist the signalman, safety on the majority of our lines still depends on the vigilance of the engineman, as in the earliest days.

Occasional failures give no ground for loss of confidence and there is no reason to believe the problem to have become more urgent of late. Colonel Wilson considers "there should be no reservations on the rate of progress once the apparatus has been approved." He accordingly recommends that "all the resources which are available to the railways should be directed to the timely accomplishment of the five-year plan and its subsequent extension as proposed, without prejudice to other necessary signalling work." The estimated first and recurring costs are large, but the expenditure should be faced without hesitation, and no financial considerations should be allowed to stand in the way of an ambitious programme, in view especially of the arduous railway conditions in this country with its dense traffic, high speeds and adverse climate in the "winter months."

Parliamentary Notes

B.T.C. Bill

The British Transport Commission Order Confirmation Bill passed the Report stage in the House of Lords on July 8, and was read the third time and passed on July 9.

Railway Reorganisation

When Mr. W. T. Proctor (Eccles—Lab.) inquired on July 13 if the Minister of Transport could give details of the scheme of decentralisation and Regional management proposed to him by the B.T.C. for British Railways, Mr. Alan Lennox-Boyd wrote in reply that no scheme under the Transport Act, 1953, for this purpose had been submitted to him.

B.T.C. Membership

Mr. W. T. Proctor (Eccles—Lab.) on July 13 asked whether the Minister of Transport could announce the names of those chosen to act on the B.T.C. for the new period of office of the Commission.

Mr. Alan Lennox-Boyd in a written reply said he could not. He had the matter under urgent consideration.

Transport Ministry Amalgamation

Mr. Alan Lennox-Boyd (Minister of Transport) on July 8 in the House of Commons moved for an address to the Queen authorising the Transfer of Func-

tions (Ministry of Civil Aviation) Order, 1953.

He said that in the Ministry of Transport numbers had been reduced from about 10,000 on April 1, 1948, to 6,240 on April 1 last, while of 7,000 in the Ministry of Civil Aviation, all but 1,385 were employed at outstations. The Government believed that as civil aviation was essentially a matter of transport it ought to be merged in a ministry of all civil transport.

Mr. G. de Freitas (Lincoln—Lab.) said that without a minister devoted exclusively to civil aviation there would be a danger of its becoming subordinated to military aviation.

Mr. J. D. Profumo (Parliamentary Secretary, Ministry of Civil Aviation) said that there was no intention of lowering the status of civil aviation. It would be possible for the two ministries to combine with no loss of efficiency and a gain in general convenience. It was a merging and not a submerging operation. From the time of the merger, the slogan would be "Business as usual."

The motion was agreed to.

London Transport Committee of Inquiry

After Mr. Allan Lennox-Boyd (Minister of Transport) had announced the names of the committee of inquiry into London Transport, as announced in last week's issue, Mr. Herbert Morrison (Lewisham S.—Lab.) queried whether the members of the committee were fit persons for their duties, in view of their ordinary occupations, such as the chairman, Mr. S. P. Chambers (a Deputy Chairman of Imperial Chemical Industries Limited), and Mr. D. E. Bell (formerly General Manager of the Yorkshire Woollen District Transport Company).

Mr. Lennox-Boyd pointed out the qualifications of Mr. Chambers and of other members of the committee.

N.U.R. Annual Conference

In his presidential address last week to the annual general meeting of the N.U.R. at Paignton, Mr. H. W. Franklin said he saw no alternative to a national wages pool through the medium of which the Government and the T.U.C. could decide on the allocation of the national income for wages and salaries. There was, he said, a tendency to overlook that when the trade union movement succeeded in achieving a turn of the wheel of the wage cycle, an inevitable result was an increase in the prices of food and other essential commodities. Until a stable cost of living could be established all pensions of the lower income groups should relate to an index closely allied to the cost of living.

On joint consultation, Mr. Franklin said that the maximum mutual trust and understanding between railway management and union members at all levels had not yet been achieved. The management could not always be blamed for this.

The Transport Act

Mr. J. S. Campbell, General Secretary of the union, said the T.U.C. was not going to let its membership sink into the abyss which might be created because of unscrupulous competition.

The conference afterwards adopted a resolution welcoming the Labour Party assurance on renationalising transport services, calling for greater participation by workers in management of nationalised transport, and promising to use every means to prevent any deterioration of living standards arising from the new Act.

Contracts & Tenders

The Metropolitan-Cammell Carriage & Wagon Co. Ltd. has received an order from the Sudan Government Railway for 20 30-ton bogie flat wagons.

Taylor Woodrow (West Africa) Limited, one of the associated companies of Taylor Woodrow Limited, has received a contract valued at £2,000,000 for building a 51-mile line from Achiisi, on the Central Provinces line of the Gold Coast Railway, to Kotoku, on the Kumasi-Accra line. The new line will open up a direct route between Takoradi and Accra, which are linked at present by a circuitous route traversing Ashanti. The work, for which Messrs. Rendel, Palmer & Tritton are consulting engineers, will take two years to carry out.

Société Anonyme des Forges, Usines et Fonderies de et à Haine-Saint-Pierre, Belgium, has received an order from the Bas Congo-Katanga Railway for six diesel-hydraulic locomotives of 700 b.h.p.

Les Ateliers Metallurgiques, S.A., Nivelles, Belgium, has received an order from the Union Minière du Haut Katanga for five 600-volt d.c. electric locomotives of 640 h.p., to be of the double-bogie single-cab type, similar to two supplied in 1952.

C. M. Hill & Co. (Engineers) Ltd., 44-45 Tower Hill, London, E.C.3, has received a contract on behalf of its Belgian principals, S.A. des Ateliers de Construction de Familleureux, for 200 bogie goods guards vans for the South African Railways.

British Railways, North Eastern Region, have placed the following contracts:—

T. Robinson & Son Ltd., Rochdale: two motor-driven sleeper incisers for West Hartlepool Sleeper Depot.

Turnerised Roofing Co. Ltd., London, S.E.11: repairs to roof of Wakefield Westgate Goods Warehouse.

F. & J. Watkinson, Bradford: improved soil drainage at Bradford Forster Square Station.

J. M. Black (Junior) Limited, Hebburn: reconstruction of portion of platform at Penshaw Station.

Baume & Merpent S.A., Morlanwelz, Belgium, has received an order from the State Railways of Thailand for four restaurant cars, eight first and second class composite coaches, and eighteen other passenger coaches, all metre gauge. The same maker recently completed delivery of 220 freight wagons to the State Railways of Thailand.

The High Commissioner for India invites tenders for metre-gauge and narrow-gauge locomotive boilers. Details appear under Official Notices on page 83.

The Director General of Supplies & Disposals, Railway Stores Directorate, New Delhi, is inviting tenders for:—

- (a) Four sets syphons, thermic steel.
- (b) 107 axleboxes, steel, rough
- (c) 158 buffer base } Steel, class II, or steel
147 buffer casing } casting.

Tenders will be received up to 10 am. on (a) July 21, (b) July 22, (c) August 12. They should be submitted to the Director General of Industries & Supplies, Shahjahan Road (Section SRI), New Delhi. The following references should be quoted:

(a) SR1/16473—D/III. (b) SR1/16457—D/I. (c) SR1/16370—D/II.

The Special Register Information Service of the Board of Trade, Commercial Relations & Exports Department, reports that the United Kingdom Trade Commissioner at Johannesburg has notified a call for tenders issued by the South African Railways Stores Department for the supply of some 4,909 nests of superheater elements to Specification C.M.E.18/1952 and Drawings L.9500.

Tenders, which should reach the Chairman, Tender Board, P.O. Box 7784, Johannesburg, by 9 a.m. on Thursday, August 13, should be enclosed in a sealed envelope marked "Tender No. B.5863 For Superheater Elements."

A copy of the tender documents giving details of conditions and specifications is available for inspection at the Board of Trade (Room 6176) by representatives of United Kingdom manufacturers until July 25. They will be available thereafter on loan in order of application. Reference CRE/23494/53 should be quoted.

The Special Register Information Service of the Board of Trade, Commercial Relations & Export Department, reports that the United Kingdom Trade Commissioner at Johannesburg has notified the following calls for tender issued by the South African Railways Stores Department:—

- 400 lifters, top.
- 960 lifters, bottom.
- 175 lifters.
- 200 lifters, bottom.
- 550 openers.
- 760 openers.
- 1,900 locks.
- 1,300 locks.
- 15 locks.
- 2,000 levers, bottom operated 8 in. by 6 in., "S" type.
- 175 levers, bottom operated 8 in. by 6 in., "S" type.
- 4,000 Atlas No. 2 knuckles.
- 6,500 Atlas type "S" knuckles.
- 3,500 Alliance No. 2 knuckles.
- 2,500 Alliance type "S" knuckles.

Tenders, which should reach the Chairman, Tender Board, P.O. Box 7784, Johannesburg, by 9 a.m. on July 23, should be enclosed in a sealed envelope marked either "Tender No. B 6524 for Automatic Coupler Spares" or "Tender No. B 6529 for Coupler Knuckles."

A copy of each of the tender documents is available for inspection in Room 6176, Board of Trade, by representatives of United Kingdom manufacturers. A further copy of each is available on loan in order of application. Reference CRE/21359/53 should be quoted.

The Special Register Information Service of the Board of Trade, Commercial Relations & Exports Department, reports that the British Embassy, Brussels, has notified a call for tenders issued by the Belgian National Railways for the design, construction and supply of:—

(i) 80 diesel shunting locomotives of 500-550 h.p. with hydraulic or hydro-mechanical transmission and 0-6-0 wheel arrangement. The weight in working order with 2,750 litres of fuel-oil is to be 57 tonnes (plus or minus 3 tonnes).

(ii) 15 diesel shunting locomotives of 700 h.p. with either (a) hydraulic or hydro-mechanical transmission and 0-8-0 wheel arrangement or (b) hydraulic, hydro-mechanical or electrical transmission and two four-wheel bogies; in the case of electrical transmission each axle of the two bogies is to be driven by a nose-suspended

motor. The weight in working order with 3,500 litres of fuel-oil is to be 80 tonnes (plus or minus 8 tonnes).

The maximum speed of the locomotives is to be 50 km.p.h. and they are to be capable of traversing a 75-metre radius curve. Tenders, which will be opened at 2.30 p.m. on Wednesday, September 30, should be addressed to the Direction du Matériel et de Achats, 24, Rue aux Laines, Brussels. A copy of the tender documents (in French) is available for inspection in Room 6176 at the Board of Trade by representatives of United Kingdom manufacturers until August 1, and thereafter on loan in order of application. Reference CRE/23017/53 should be quoted.

Notes and News

Easterbrook Allcard & Company: Change of Address.—The London office of Easterbrook Allcard & Co. Ltd. has been moved to 7-9, Glentworth Street, Baker Street, N.W.1 (Tel. Welbeck 8335/6).

Broom & Wade Exhibit at Olympia.—In our July 10 issue mention was made of the equipment to be exhibited by Broom & Wade Limited at the forthcoming engineering exhibition at Olympia. It has subsequently been announced that the type SV.245 Broomwade portable sleeve-valve compressor will be replaced by type SV.398.

Western Welsh Omnibus Co. Ltd.—At the annual general meeting of the Western Welsh Omnibus Co. Ltd. on July 9, Mr. J. S. Wills, chairman, who presided, said that for the first time in the company's history, total revenue had reached £2,000,000. The cost of their fuel oil, even without the tax, was 400 per cent of its 1939 cost. Some 94,500,000 passengers, an increase of almost 1,500,000, were carried during the year.

Royal Train in Northern Ireland.—The Queen and the Duke of Edinburgh travelled by rail between Lisburn and Lisahally on July 3 in the course of their Northern Ireland tour. The train conveying them was composed of ten coaches (six provided by the Great Northern Railway (Ireland) and four by the Ulster Transport Authority), finished in blue and cream. It was hauled by U.T.A. 2-6-0 locomotive No. 102. The Royal pair travelled in a saloon built in 1911 and

used normally by G.N.R. directors or officers. Lord Glenavy, Chairman, G.N.R. (I), Mr. G. B. Howden, Chairman, and Mr. J. A. Clarke, General Manager, Ulster Transport Authority, and chief officers of both undertakings, also travelled on the train, which was routed via Antrim and Ballymena.

Morgan Crucible Co. Ltd.—A proposed final dividend for the year ended March 31 last of 8½ per cent will maintain the total distribution by the Morgan Crucible Co. Ltd. at 12½ per cent for the seventh consecutive year. Preliminary figures show a group profit of £1,524,056, against £1,966,918 for the previous year. The net profit of £707,987 compares with £855,758 a year ago.

Iron & Steel Board Premises.—From July 13, the Iron & Steel Board has assumed its responsibilities under the Iron and Steel Act, 1953. The Board is in the course of arranging accommodation and staff. Offices are being equipped at Norfolk House, St. James's Square (telephone No. WH1 6931) which is the board's headquarters and where there is already a nucleus staff.

Supply of Technicians for Industry.—Among the developments commented on by Mr. Richard Miles, chairman of Head, Wrightson & Co. Ltd., at the company's recent annual meeting was the beginning of a scholarship scheme for selected apprentices, as a corollary to the company's apprentice school. Despite increased expenditure on social services and education, they were still not seeing a corresponding improvement in the extent of the technical staff. They had therefore decided to assist themselves. Mr. Miles said that the high overheads for social services must be recouped by the high quality of their designs and products. With few natural resources except coal and brains, this country could not maintain its standard of living unless it maintained its lead technically.

Prompt Rail Despatch of Exhibit to Royal Show.—Special arrangements were made by British Railways, London Midland Region, to put agricultural produce, the Essex Farmers' exhibit at the Royal Show at Blackpool, on the 5.5 p.m. passenger train from Euston to Blackpool on Tuesday, July 7. The consignment arrived on time and was specially delivered by British Railways to the showground. Workmen then toiled all



The Royal train from Lisburn to Lisahally on July 3, on the U.T.A. (former Northern Counties Committee) Belfast to Londonderry main line

The engagement of persons answering Situations Vacant advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order, 1952.

TECHNICAL SALES REPRESENTATIVE for the North of England required by a firm specialising in the supply of materials to the Transport Industry. Engineering training or background an advantage, age between 28 and 38; remuneration by salary, according to age and experience. Pension Scheme. Apply Box No. 893, *The Railway Gazette*, 33, Tothill Street, S.W.1.

THE PERUVIAN CORPORATION have the following vacancies on the railways in Peru:—Central Railway, ACCOUNTANT (Traffic Auditor). About 30 years of age, preferably single with general auditing and railway accounting experience. Northern Railways, DIESEL ENGINEER with practical experience on diesel locomotives and railcars and workshop management. Southern Railway, ASSISTANT CHIEF STOREKEEPER—an experienced Railway Storekeeper with a knowledge of Spanish essential. A knowledge of the Spanish Language is preferable in all these appointments or willingness to learn within 6 months. Apply: SECRETARY, 144, Leadenhall Street, London, E.C.3.

DESIGNERS wanted with practical experience of Railway Rolling Stock. Used to calculations. Knowledge of diesel railcars would be an advantage. Applications in writing to: A.E.C. LIMITED, Staff Records Office, Windmill Lane, Southall, Middlesex, giving age, experience and salary required.

night so that it would be ready for judging on Wednesday morning, when it gained the first prize.

British Insulated Callender's Cables: Telephone Number.—British Insulated Callender's Cables Limited announces that the new telephone number of its Derby depot is Derby 43697. The telephone number of the Southampton branch office has also been changed, to Southampton 76176/7.

Fallside Station, Scottish Region.—The Scottish Region announces that on and from Monday, August 3, the passenger train service at Fallside Station (between Uddingston Central and Motherwell) will be discontinued and the station will be closed. A bus service operates between Fallside and Uddingston for connection with rail services. Parcels and other merchandise conveyed by passenger trains will be dealt with at Uddingston Central Station, from which point a motor vehicle will collect and deliver traffic in the Fallside area.

Shipment of Toronto Underground Stock.—The first consignment of the 104 cars being built by the Gloucester Railway Carriage & Wagon Co. Ltd. for the underground railway of the Toronto Transportation Commission which is now under construction, were shipped aboard the ss. New York City at Avonmouth Docks, Bristol, last weekend. The whole of the stock will be shipped through the Port of Bristol direct to Montreal during the next few months. The cars will be carried as deck cargo by regular liner services. The underground railway is due to be completed at the end of the year.

Rolling Stock Builder's Acquisition Proposal.—An extraordinary general meeting of the Gloucester Railway Carriage & Wagon Co. Ltd. will be held on July 29 to consider an increase of capital by £75,000 so that shares may be available for issue

HER MAJESTY'S COLONIAL SERVICE

THE following vacancies exist for Mechanical Engineers in the Railway Department, Nigeria. ASSISTANT DISTRICT SUPERINTENDENT (Locomotive) (CDE, 110/14/010). Duties include responsibility to the District Superintendent for the direction and efficient maintenance and working of the Locomotive Running Section. Appointment either pensionable or on contract at a fixed salary of £1,735 per annum or £1,930 per annum respectively. Candidates, not less than 35 years, must be A.M.I.Mech.E., must have served apprenticeship and pupillage in Locomotive Repair Workshop with subsequent experience, and have had at least 10 years on administrative duties in Locomotive Running Department. Drawing Office experience an advantage. SENIOR ASSISTANT LOCOMOTIVE SUPERINTENDENT (CDE, 110/10/04). Duties include supervision of European and African staff and general administration in a district. Appointments will be pensionable on probation in scale £1,400—£1,560 per annum or on contract in the range £1,656—£1,898 per annum. Candidates between the ages of 32-40, should have served an apprenticeship and pupillage in a Locomotive Repair Workshop and thereafter have had footplate and Running Shed experience, and at least 7 years on administrative duties in a Locomotive Running Department. Candidates must be A.M.I.Mech.E. or be exempt from Parts A & B of the examination for Associate Membership and be prepared to obtain corporate membership during period of probation or contract. On contract appointments a gratuity of £100-£150 per annum is payable on satisfactory completion of contract. Free first class passages for officer and his wife and an annual maintenance allowance or free passage allowance up to £75 each is payable in respect of a maximum of 2 children. Furnished quarters available at rental charge of 10% of basic salary. Leave is granted at rate of 7 days for each month of residential service after tour of 18-24 months. Apply in writing to the Director of Recruitment, COLONIAL OFFICE, Great Smith Street, London, S.W.1, giving briefly age, qualifications and experience. Mention the reference number shown against the post applied for.

in exchange for shares in the capital of Hatherley Works Limited. The company bought a controlling interest in Hatherley Works Limited some years ago, and the directors are now of the opinion that it is desirable to acquire the undertaking as a wholly-owned subsidiary. The Hatherley company has for some years carried on the manufacture of furniture of all descriptions, particularly garden furniture.

M.O.S. approved organisation has immediate capacity in a new factory for all types of high class sheet metal fabrication and light constructional work. Plate up to 5/16-in. thickness handled. Guillotine capacity up to 8 ft. × 1 in. and 10 ft. × 3/16 in.; bending up to 8 ft. × 5/16 in. and 10 ft. × 1/2 in.; rollers, circle cutters, oxy-acetylene profilers, etc. Work done in aluminium, brass, copper, mild and stainless steel, black and galvanised sheet, lead coated and tin plate. Facilities include gas, electric arc, argonarc and bronze welding; jig welding and the use of manipulators. Special paint finishes applied as required, also metal spraying, bonderizing, phosphating and rubber covering. Quantity production of items no obstacle—we have 24,000 sq. ft. of floor space and skilled personnel to cope. Apply—KEITH BLACKMAN, LIMITED, Mill Mead Road, London, N.17.

FOR SALE. 60-tons Horiz. Hydraulic Wheel Forcing Press, 38½ in. between tie rods, daylight 6 ft. 6 in., ram travel 12 in., with hand pump. Box 865, *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

INTERNATIONAL RAILWAY ASSOCIATIONS. Notes on the work of the various associations concerned with International traffic, principally on the European Continent. 2s. By post 2s. 2d. *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

BOUND VOLUMES.—We can arrange for readers' copies to be bound in full cloth at a charge of 25s. per volume, post free. Send your copies to the SUBSCRIPTION DEPARTMENT, Tothill Press Limited, 33, Tothill Street, London, S.W.1.

N.E.R. HISTORY.—Twenty-Five Years of the North Eastern Railway, 1898-1922. By R. Bell, C.B.E., Assistant General Manager, N.E.R. and L.N.E.R. Companies, 1922-1943. Full cloth. Cr. 8vo. 87 pages. 10s. 6d.—*The Railway Gazette*, 33, Tothill Street, London, S.W.1.

Destruction of the production department by fire in December, 1952, has made it necessary to reach a decision as to the long-term future of the company.

British Railways Heavy Traffic.—Holiday traffic by the "Starlight Special" trains between London and Scotland was again heavy on Friday and Saturday, July 10 and 11, when a total of 6,567 passengers

East Coast Main-Line Working



The up "Tees-Tyne Pullman" near Knebworth, Eastern Region. As recorded in our June 12 issue, this train on the first day of the summer timetable (June 8) covered the 232½ miles from Darlington to Kings Cross in 223 min., 6 min. less than the schedule, with a load of 316 tons

travelled in 20 trains. On Saturday, 184,150 passengers travelled from the principal London termini in 540 long-distance trains. Deep-mine and opencast coal cleared by rail during the week ended 6.0 a.m. on July 13, amounted to 2,926,230 tons, including 306,450 tons carried at the weekend. Iron and steel conveyed from principal steel works in the week ended July 4 totalled 223,367 tons, and 352,200 tons of iron ore were carried.

Coast Resort Illuminations: Excursions from N.E. Region.—Seventy-two excursions have been arranged from stations in the North Eastern Region to the illuminations at Blackpool (September 11—October 26), and 56 to Morecambe (August 21—October 19). Seven of the trains to Blackpool and six of those to Morecambe will be private excursions.

Glyn, Mills & Company.—The report of Glyn, Mills & Company for the year ended June 30, 1953, shows total assets of £70,180,944, as compared with £70,479,837 in the previous year. Coin, bank notes, and balance with the Bank of England rose from £4,474,327 to £5,286,810; and balances with, and cheques in course of collection on, other banks in the British Isles, were £3,993,435 against £3,733,581. Money at call and short notice was lower at £10,809,000 as compared with £12,451,000.

Pinchin Johnson & Associates Limited.—The consolidated profit and loss account of Pinchin Johnson & Associates Limited, and subsidiary companies for the year ended March 31 last shows combined profits of £1,476,076 as compared with £1,958,819 the year before. After addition of income from trade and other investments, the final result of £1,546,807 compares with £2,027,164 in 1951-52. Deductions for goodwill, depreciation, directors' emoluments, and pension scheme, leave £245,980. Last year the corresponding figure was £253,792.

Carriers' Licences: Application by Buyers of B.T.C. Vehicles.—The Minister of Transport, Mr. Alan Lennox-Boyd, has made regulations to give effect to the Transport Act, 1953, as to carriers' licences. The new regulations prescribe the procedure for application for carriers' licences to operate vehicles acquired from the British Transport Commission. The licences will be valid for five years and will not be subject to the 25-mile restriction, which save under permits issued by the B.T.C., will otherwise remain in general operation for vehicles carrying goods for hire or reward until the end of 1954.

Wakefield-Dick Industrial Lubricants.—In addition to a wide variety of Wakefield-Dick industrial lubricants, C. C. Wakefield & Co. Ltd. will be exhibiting at the Engineering & Marine Exhibition at Olympia its lubricator demonstration unit. This mobile unit is designed to show the action of mechanical lubricators, both oil and grease. A wide range of kindred lubrication equipment will also be on view. The demonstration unit has already been on a brief tour of the country, and engineering executives are invited to inspect the unit and to make an appointment if they wish for a demonstration in their works.

Electrical Wiring Equipment.—British Insulated Callender's Cables Limited is exhibiting at the Engineering, Marine & Welding Exhibition, to be held at Olympia, London, from September 3 to 17,

specialised types of cables for ships wiring, including mass-impregnated non-draining cables, aluminium-sheathed wiring cables, aluminium-sheathed V.R.I.- and P.V.C.-insulated control cables, together with resilient moulded connector units, extensible T.R.S. flexibles, and silicone-rubber-insulated cables. Also on view will be asbestos-insulated cables, T.R.S. trailing cables, including arc welding flexibles, copper busbars, current collector equipment for cranes and conveyors, paper pinions, plug-type feeder pillars, detachable fused tee boxes and so on.

C. C. Wakefield & Co. Ltd.—The factors of the increased costs and intensified competition which had made themselves felt in 1951 continued to prevail last year, and although sales were maintained, the profits of C. C. Wakefield & Co. Ltd declined because of lower margins. Mr. L. W. Farrow, chairman of the company, men-

tioned these conditions in quoting the consolidated net profit of the company and its subsidiaries for 1952 at the annual general meeting, which at £341,557 represented a decrease of £132,384. Stockholders would be interested to know that during the last six years, 1947-1952 inclusive, the aggregate profits retained in the business had amounted to £1,238,964, and this was after paying £3,811,257 in taxation and £1,591,275 in dividends, including the final dividend recommended for payment in respect of the year 1952.

Forthcoming Meetings

July 28 (Tue.).—Railway Students' Association. Evening visit to new Carriage Depot at Willesden. Party meet in booking hall, Stonebridge Park, L.M.R., at 5.50 p.m.

Railway Stock Market

There has been an undecided tendency in stock markets this week, with small, irregular movements in most sections. A week ago there were signs of improved demand developing, but buyers have turned cautious again. This is due partly to the Egyptian news and partly because of a tendency to await the reaction of New York markets to the signs of an early cease-fire in Korea. General belief is that a Korean cease fire would not be followed by any big reduction in rearmament, which will have to await an agreement with Russia. Meanwhile metal and commodity prices are already declining sharply on the prospect of a big cut in U.S. stockpiling. Logically lower metal prices are a bull point for industrial companies, but industrial shares were quieter this week, and British Funds less firm. Sentiment was affected by the further rise in the trade deficit shown by the overseas trade figures for June and by Mr. Butler's warning of the vital need to increase exports. Industrial shares generally held last week's moderate gains, but demand this week was very selective.

There were fewer dealings in foreign rails. Chief feature was profit-taking in United of Havana stocks, awaiting news of Mr. Wenner-Gren's take-over offer and terms of the proposed deal. At the time of writing, the "A" stock has reacted to 71, the "B" to 66, the second income stock to 23½, while the consolidated stock changed hands around 4. Canadian Pacific at \$47½ reflected the easier trend in dollar stocks; the 4 per cent preference was £64½ and the 4 per cent debentures £83. White Pass & Yukon remained an active feature, but fluctuated and came back to \$28½ after an earlier gain; the convertible debentures were £103.

Elsewhere, Antofagasta ordinary stock firmed up to 8½ and the 5 per cent preference stock to 42½. There was again very little business in Manila Railway stocks, with the "A" debentures at 78 and the 5 per cent preference 8s. Chilian Northern first debentures changed hands down to 21, Nitrate Rails shares were 20s. 9d., Dorada Railway ordinary stock 48, and Guayaquil & Quito first mortgage bonds around 36. Brazil Railway bonds marked 6½, while among Indian rails, Barsi were 120. Emu Bay Railway 4½ per cent debentures were 54½ and Nyasaland Railways 3½ per cent debentures 74½. International of Central

America common shares marked \$14 and the 5 per cent bonds £147.

Costa Rica Railway first debentures were 67½ with the second debentures 61½, while Paraguay Central prior debentures were quoted at 16½. In other directions, San Paulo ordinary units were again 6s. Among home stocks, Metropolitan Assented changed hands around 44. Mexican Central "A" debentures were easier at 73.

As usual, road transport shares remained firmly held, with Southdown at 32s., West Riding 36s. 6d., and Lancashire Transport 51s. 3d.

B.E.T. deferred stock after its recent sharp rise reflected a little profit-taking at £565. When this stock is split into 5s. units, it is expected to have a much more active market as it will be within the reach of the small investor. Based on the current price for the stock, the equivalent price for the 5s. units would be 28s.

There has been rather more business in engineering and kindred shares. Vickers strengthened further to 49s. 9d. Although there has been no official news that negotiations have started on the question of the former big interest in the English Steel Corporation, it is assumed that Vickers will reacquire this. The market is still uncertain whether acquisition of the English Steel interest would mean that Vickers would have to raise more capital, though it is hoped that, if this is necessary, it would be raised by a "rights" issue to shareholders on attractive terms.

Cammell Laird, Guest Keen, and John Brown are among other well-known companies which will shortly have to make a decision on the repurchasing of their former steel interests; and presumably it will depend on the outcome of negotiations on the terms for this. Babcock & Wilcox have been firm at 63s. 9d., Ruston & Hornsby, whose results are due shortly, held their rise to 38s. 6d. and T. W. Ward were 71s. 9d.

Beyer, Peacock showed firmness at 33s. 3d., Central Wagon changed hands at 68s., Hurst Nelson were 40s., and North British Locomotive 13s. Elsewhere, Vulcan Foundry strengthened to 20s. 9d. and Charles Roberts 5s. shares to 16s. 3d., while Gloucester Wagon 10s. shares were 13s. 3d. Wagon Repairs 5s. shares were steady at 12s. 3d., after the dividend announcement.